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CONFERENCE

ON

MEDICAL MISSIONS

APRIL 3 TO 5, 1928

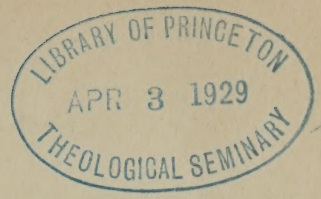
RIVERDALE COUNTRY SCHOOL
NEW YORK CITY



Under the auspices of
The Committee of Reference and Counsel
of the Foreign Missions Conference of North America
419 FOURTH AVENUE
NEW YORK CITY

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Foreign Missions Conference
of North America. Committee
Conference on medical
missions



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CONTENTS

INTRODUCTORY NOTE	5
PROGRAM OF THE CONFERENCE	6
THE USE OF FURLOUGH FOR DOCTORS—Dr. E. H. Hume	7
THE USE OF FURLOUGH FOR NURSES—Miss Isabel M. Stewart	8
IMPORTANT MEDICAL PROBLEMS IN AFRICA—Dr. P. H. J. Lerrigo	15
MEDICAL EDUCATION IN AFRICA—Dr. J. B. McCord	21
TYPES OF SERVICE FOR MEDICAL MISSIONARIES:	
Utilitarian Type—Dr. Henry S. Hollenbeck	32
Small Hospital Type—Dr. E. W. Smalzried	37
Large Hospital Type—Dr. Leroy Heimbürger	38
SUMMARY OF REPLIES TO QUESTIONNAIRE REGARDING MEDICAL SCHOOLS— L. B. Moss	43
AMEBIC LIVER ABSCESS—Dr. A. I. Ludlow	52
ANAESTHETIC TECHNIQUE IN OBSTETRICS DEVELOPED AT LYING-IN HOSPITAL —Dr. James A. Harrar	53
PROBLEMS IN LICENSURE IN VARIOUS COUNTRIES—Dr. Mark Ward	59
THE MEDICAL DEPARTMENT IN RELATION TO BOARD ADMINISTRATION— Dr. J. G. Vaughan	64
NEUROSES AS SEEN IN MISSIONARIES—Dr. A. G. Odell	68
STUDY OF HEALTH RECORDS—Dr. George T. Tootell	83
SELF-SUPPORT FOR MISSION HOSPITALS—Dr. E. C. Cort	94
FACTORS IN THE COMPLETE NATIONALIZATION OF MEDICAL WORK— Dr. Theodore Bliss	100
Dr. Hugh H. Weir	104
DIET IN THE TROPICS—Dr. Wm. E. Deeks	107
A HEALTH PROGRAM FOR MISSION SCHOOLS—Dr. Fred J. Wampler	117
SYMPOSIUM ON PUBLIC HEALTH NURSING—Miss E. K. Pennepacker, Miss Orpha B. Gould, and Miss Cornelia Dalenberg	123
PERSONNEL OF MEDICAL CONFERENCE	124
FINDINGS OF THE CONFERENCE	126

CONFERENCE ON MEDICAL MISSIONS

NEW YORK CITY, APRIL 3-5, 1928

A Conference on Medical Missions was held under the auspices of the Subcommittee on Medical Missions of the Committee of Reference and Counsel, at the Riverdale Country School in New York City. The Conference began at 10:30 o'clock on Tuesday morning, April 3 and continued in session at the Riverdale School until noon on Thursday April 5. On Thursday afternoon the members of the Conference went in a body to the new building of the Presbyterian Hospital where they had an opportunity to inspect the building and to meet a number of the members of the staff who spoke briefly on various subjects.

The presiding officer of the Conference was Dr. Randolph T. Shields, dean of the Medical School of Shantung Christian University at Tsinan, China. Mr. Leslie B. Moss acted as secretary.

Dr. F. F. Tucker, missionary of the American Board in China, gave the opening devotional address on the general theme "And I, if I be lifted up from the earth, will draw all men unto me."

A Findings Committee was appointed under the chairmanship of Dr. Mark Ward. The findings of this committee were presented at the session on Thursday morning and as finally adopted appear at the end of this volume.

The program which appears on pages 6 and 7 was prepared by a small subcommittee of the Medical Committee consisting of J. G. Vaughan, E. M. Dodd and Leslie B. Moss. The majority of the papers that were presented on this program are printed herewith, either in full or in outline in the order of their presentation.

Notes were taken of the discussion following the various papers, but it has been the feeling of the committee that they hardly set forth adequately such additional ideas as were presented to the Conference and it did not seem fair to quote certain members of the conference in discussion without quoting all those who took part. It should, however, be noted, that, in connection with the session on Tuesday evening which was especially designed to be of interest to any medical mission candidates who might be able to attend, Dr. Dorothy Dunning, one of the candidates who was present, brought up the following questions which are of concern to candidates: (1) They would like to know the schools where scholarships and other forms of help are available for students. (2) What can medical students do with their summers that will be advantageous? (3) Where and how can they get training in public health and preventive medicine? (4) How can they get training for the administration of hospitals? (5) The whole subject of religious maintenance—should they take a year for special religious training and how should they use it; what should they specialize in? While no attempt was made to answer these questions in the conference they were recog-

nized as of vital interest and importance to the medical student volunteer and subjects which ought to be given consideration at some future conference.

There were present at the sessions of the conference a total of 70 persons. Of these 41 are missionaries in active service; 5 are candidates or are already under appointment to the field; 7 were mission board secretaries and 9 had been missionaries but are not now in active service.

CONFERENCE ON MEDICAL MISSIONS

APRIL 3 TO 5, 1928, AT
RIVERDALE COUNTRY SCHOOL, NEW YORK CITY

Held under the auspices of the Committee of Reference and Counsel of the Foreign Missions Conference of North America, 419 Fourth Avenue, New York City.

PROGRAM

Chairman, Dr. R. T. Shields, Dean, Medical School, Shantung Christian University, Tsinan, China.

TUESDAY, APRIL 3, 10:30 A.M.

Call to order and Organization of Conference—10:30.

Appointment of Findings Committee.

Opening Address—10:35 to 11:00—Dr. F. F. Tucker, Tehchow, China.

The Use of Furlough for Doctors—11:00 to 11:30—Dr. E. H. Hume, Director of Post-Graduate Medical School and Hospital, New York.

The Use of Furlough for Nurses—11:30 to 12:00—Miss Isabel M. Stewart, Professor of Nursing Education, Columbia University.

TUESDAY AFTERNOON, 2:30 P.M.

Important Medical Problems in Africa—Dr. P. H. J. Lerrigo, Home Department Secretary, American Baptist Board.

Medical Education in Africa—Dr. J. B. McCord, Africa Missionary of A. B. C. F. M.

TUESDAY EVENING, 7:30 P.M.

Candidate Matters.

Types of Service for Medical Missionaries:

(a) Utilitarian Type—Dr. Henry S. Hollenbeck, Africa Missionary of A. B. C. F. M.

(b) Small Hospital Type—Dr. E. W. Smalzried, China Missionary of Evangelical Board.

(c) Large Hospital Type—Dr. Leroy Heimbarger, Professor of Dermatology, Shantung Christian University Medical School.

Summary of Replies to Questionnaire Regarding Medical Schools—L. B. Moss, Secretary, Foreign Missions Conference of N. A.

Medical students and nurses of New York City and vicinity are invited as our guests at this session.

WEDNESDAY MORNING, APRIL 4, 9:00 A.M.

Devotional Period—9:00 to 9:15—Dr. Grafton Burke, Alaska Missionary of the Episcopal Board.

Amebic Liver Abscess—9:15 to 9:45—Dr. A. I. Ludlow, Professor of Surgery, Severance University Medical College, Seoul, Korea.

Researches in Maternal Health—10:15 to 10:45—Dr. R. L. Dickinson, Formerly President of the American Gynecological Association.
Sterility Studies—Diagnosing the Obscure Cases—10:45 to 11:15—Dr. Wm. H. Cary, Brooklyn Hospital.
Anaesthetic Technique in Obstetrics Developed at Lying-in Hospital—11:15 to 11:45—Dr. James A. Harrar, Attending Surgeon.

WEDNESDAY AFTERNOON, 2:30 P.M.

Problems of Licensure in Various Countries—Dr. Mark Ward, Medical Secretary, A. B. C. F. M.
The Medical Department in Relation to Board Administration—Dr. J. G. Vaughan, Medical Adviser, Method Episcopal Board of Foreign Missions.
Neuroses as Seen in Missionaries—Dr. A. G. Odell, Neuro-psychiatrist, Clifton Springs Sanitarium.
Study of Health Records—Dr. E. M. Dodd, Medical Secretary, Presbyterian Board.
Moving Pictures—5:30—"The Patient's Progress—or How the Hospital Helped Mr. Chang to Get Well"—Dr. Theodore Bliss.

WEDNESDAY EVENING, 7:30 P.M.

Self-Support for Mission Hospitals—Dr. E. C. Cort, Siam Missionary, Presbyterian Board.
Factors in the Complete Nationalization of Medical Work:
Dr. Theodore Bliss, China Missionary, Protestant Episcopal Board.
Dr. Hugh H. Weir, Medical Secretary, S. P. G., England.

THURSDAY MORNING, APRIL 5, 9:00 A.M.

Devotional Period—9:00 to 9:15—Dr. N. S. Hopkins, China, Missionary of the Methodist Board.
Diet in the Tropics—9:45 to 10:15—Dr. Wm. E. Deeks, Medical Director of the United Fruit Company.
A Health Program for Mission Schools—Dr. Fred J. Wampler, Director, Accomack-Northampton Health Unit, Virginia.
Symposium on Public Health Nursing.
Findings.

THURSDAY AFTERNOON

Informal presentation of special topics by Dr. A. O. Whipple, Chief Surgeon of Presbyterian Hospital, assisted by other members of the staff. The Session will be held in the new Presbyterian-Columbia Medical Center at 168th Street and Broadway. An opportunity will be given to inspect the new hospital.

THE MEDICAL MISSIONARY ON FURLOUGH

DR. EDWARD HICKS HUME

The medical missionary on furlough has the choice of three courses—to rest completely, if he has been ill; to secure real mental and professional recreation; or to do promotion work for his society. The first and third have to be faced with the officers of his society, but if he is free to take up professional work he ought to be prepared to do it with attention to fundamentals.

It is suggested for the man interested in surgery that he go to an institution where he can have the opportunity to dissect, to study operative surgery on the cadaver, and to study the physiology of the human body. This is far more important than watching

operations casually from the seats of an amphitheatre. If he can secure a position as house officer, as a number of men are doing this year, he will get closer to the operative surgeon than in any other way.

If he is interested in medicine, he should study physiology, biochemistry and basal metabolism. Only in this way can he become familiar with the underlying principles of modern internal medicine. Here also he should seek, if possible, an opportunity as a house officer.

The medical missionary on furlough should lose no opportunity to attend the scientific meetings in which he feels most interested and he should also make it a point to study and write on the basis of the material that he has had available while abroad.

The main point to keep in mind is that the medical missionary must so practice as to keep himself thoroughly abreast of the leaders in the profession. The day has passed when a man, because of a religious message, can be justified in practicing poor medicine.

THE USE OF THE FURLOUGH FOR MISSIONARY NURSES

ISABEL M. STEWART

*Professor of Nursing Education, Teachers College, Columbia University,
New York City*

It was only after I had begun to prepare this paper that I realized how rash it was for a person with no foreign missionary experience to try to interpret the needs of missionary nurses. If you had asked me to tell you something of the life of a home missionary's daughter on the Western prairies somewhere in the late nineties, I should have no hesitation at all because those experiences are still fresh and vivid in my memory. Home missionaries never had any furloughs, however, at least not when I knew them. Year after year they went through summer's heat and winter's cold, with a blissful disregard of rest and change, except perhaps for the occasional dissipation of a presbytery or synod meeting. But the foreign missionary boards have found that the furlough pays, by infusing new life into the missionary and by bringing fresh currents of knowledge and zeal into the work itself.

Although I have had no missionary experience myself, I have had fairly intimate contacts with missionary nurses for many years, through my work in the Department of Nursing Education at Teachers College, where we have had many nurses from foreign countries including a score or two from mission fields in China, India, Persia, Japan and the Philippines. I have talked with many of these and I have recently written to a number of nurses who are on furlough in this country, and to a few nursing schools where missionary nurses are admitted for special work. The material I have hastily gathered together is by no means comprehensive or exhaus-

tive. It simply opens up the subject for further exploration and discussion.

The questions I have put to these nurses are as follows:

1. What are the most outstanding needs of foreign missionary nurses who return to this country on furlough?

2. What kinds of opportunities are most needed for this group of workers?

3. What difficulties, if any, do missionary nurses find in securing and making use of these opportunities?

4. What concrete practical suggestions can you make to Mission Boards or to Educational Institutions, which would help to improve the present facilities?

It is probably unnecessary here to discuss those needs which nurses share in common with other workers in the foreign field, first of all the need for physical rest and recreation and almost as important the need for normalizing human contacts and for cultural opportunities. Many nurses are so depleted physically that they need to be put to bed and fed up before attempting to study or do anything else. One is inclined to suggest that what James calls "a moral holiday" is also in order for this group, nothing very wild or wicked, but just a little loosening of the screws, and a temporary release from that overpowering sense of duty which seems to be rather exaggerated in some of the missionary nurses I have known. It seems to me that music and plays and parties and other "extra-curricular activities" should be a part of the educational program just as much as the professional and the religious part, but I shall not attempt to deal with these things.

In discussing the professional needs of missionary nurses, it is obvious that we shall have to consider several types of workers. Some are much more experienced than others, hold more responsible positions, have a much better educational and professional background to begin with, and are much more closely in touch with modern nursing methods.

All of them feel rusty and need "brushing up" in the latest ideas and methods, but some have large gaps in their fundamental background which would need to be filled in with good solid educational filling, instead of simply trying to remove the superficial rust. In the majority of cases, the foundation has been fairly well built, but it is entirely too narrow and too specialized for the kind of structure they have been trying to build on it. The demands of a mission hospital in an isolated district would seem to exhaust the resources of the most varied kind of training and the widest experience available anywhere. According to the evidence of many missionary nurses, they often have to combine the functions of administrator of both hospital and training school, teacher, accountant and book-keeper, dietitian, housekeeper, anaesthetist, clinic nurse, pharmacist, laboratory technician, midwife and social service worker with the missionary duties thrown in. Not only are the duties more varied,

but the nurse has less machinery and fewer resources to work with than she would find at home.

It is not much wonder then that the missionary nurse usually feels the need of supplementing her education along several of these auxiliary lines when she returns on furlough.

This is not so easy since all these functions have now become highly specialized and it is far more difficult every year to switch over from one line of work to another, or to pick up in a short time a general working knowledge, say of anaesthesia, or laboratory technique, or training school administration or teaching. Those of us who are working in America have long ago given up all hope of even keeping in touch with all the specialties in nursing and associated fields. The missionary nurse should analyze her own situation, size up her outstanding assets and liabilities, and set up a few working objectives which can be combined in a reasonable year program, and let the rest go till the next time.

One successful nurse of long experience in foreign work outlines what she thinks the nurse needs most:

1. To learn the technical advances which have been made since the last furlough.
2. To learn new methods in her specialty, administration, education, public health, etc.
3. To get acquainted with workers in similar branches at home for consultation.
4. To re-orient her field, in view of new discoveries and new thought.

The next question is about the opportunities which would be needed to give the nurse on furlough the kind of preparation she requires. The subjects and fields most frequently mentioned are as follows:

1. Hospital administration with emphasis on buying, business methods, hospital architecture, etc.
2. Nursing school administration and teaching.
3. General nursing methods.
4. Obstetrical nursing or midwifery training.
5. Pediatric nursing.
6. Anaesthesia.
7. Laboratory technique.
8. Dispensing of drugs.
9. Public health.
10. Social studies.

There are several ways of acquiring information and training in these subjects:

1. Through formal study in a school or college where the subject is taught mainly through lectures, discussions, etc.
2. Through observations at various hospitals and health centres.
3. Through practical courses where students are given experience in the hospital or public health organization with instruction on the patients.
4. Through paid work in an up-to-date institution or organization where the student can pick up new ideas and educate herself as she goes along.
5. Through conventions, meetings, etc., and through individual conferences.

It may be possible to include all of these types of experience in one furlough, but as a rule the choice will depend on the subjects to be

studied, the general background of the student, her financial and physical condition and the time she has free for study. With one exception, these opportunities are all available somewhere in America, the difficulty is to find them readily and to build them into an educational program adapted to the needs of the individual student. There are several American colleges and universities now offering courses in public health nursing to graduate nurses and a few where courses in administration, supervision and teaching in nursing schools can be secured, either in the regular college term or the summer session or both. Proceeding from the East to the West, the following university centres may be mentioned as examples:

Teachers College, Columbia University, New York, N. Y.
Simmons College, Boston.
Yale University, New Haven.
Philadelphia School of Social and Health Work, Philadelphia.
Western Reserve University, Cleveland, Ohio.
George Peabody College, Nashville, Tennessee.
Cincinnati University, Cincinnati, Ohio.
Michigan University, Ann Arbor, Michigan.
University of Chicago, Chicago, Illinois.
Minnesota University, Minneapolis.
Indiana University, Indianapolis.
California University, Berkeley, California.
Washington University, Seattle, Washington.

There are many other centres where missionary nurses would be welcomed as visitors and where definite observations and conferences would be arranged for them. Yale University School of Nursing has been particularly successful in carrying on this form of instruction for visiting groups wishing to study nursing organization, methods of teaching and nursing methods.

In addition there are many postgraduate courses carried on by general and special hospitals, where such students may receive good practical instruction in obstetrical and pediatric nursing, communicable disease nursing, etc., of three to six months' duration. The student pays nothing as a rule for such courses, or rather she gives her services in return for her instruction and often receives a small allowance in addition.

It is rather a strange thing that we have no real system in this country for training nurses as midwives. Where such nurses are needed, as they are in the Kentucky Mountains, they have to be imported from Great Britain or American nurses have to be sent over there for training. Missionary nurses have often regretted this lack in our educational system and have hoped that we might develop at least one good school where nurses going to foreign fields might receive training as midwives. This whole subject is under discussion at the present time by a committee of nurses and physicians, and we are all hoping that a way may be found for supplying such training on a good sound basis in this country.

Courses in anaesthesia and laboratory technique have been or-

ganized in a few hospitals and it is probable that practical courses in dispensing may also be available in hospital pharmacies, though I have no definite information about this.

Opportunities for just the right kind of positions in up-to-date hospitals may not be so readily available, but I have letters from large hospitals such as the Philadelphia General, the Western Reserve Hospitals, Cleveland, and the University of Michigan Hospital, Ann Arbor, stating that several missionary nurses have been taken on the staff and rotated from department to department in order that they might brush up in special phases of clinical work. Some have been given opportunity to observe teaching and administrative methods and to assist in the class room or office, receiving their maintenance during this time from the hospital. It is assumed, of course, that the nurse will have a satisfactory background for this kind of work and that she will stay long enough to make the experience worth while to herself and not entirely unproductive to the hospital.

The third question asked was about the difficulties which nurses find in securing and making use of these opportunities. The replies may be summarized as follows:

1. *Health difficulties.* The nurse may be so handicapped physically that she has not the energy to spend on study and particularly on practical experience in hospitals where she is likely to be on the same full-time duty as other workers.

2. *Financial difficulties.* This applies especially to the courses in colleges and universities, where the fees are fairly high and the student has to cover living costs as well. Full scholarships are rarely available, travel is also expensive, so that visits, attendance at conventions, etc., often have to be curtailed on this account.

3. *Difficulties of adjustment.* The time of the nurse is often seriously broken by "deputation work" and other duties so that it is hard to get even three or four months' straight time for such study and exceedingly difficult to get a complete academic year. Where the work is chopped up in this way, the results are apt to be unsatisfactory all round. At Teachers College we make special concessions for nurses on furlough, allowing them to come for one term only if necessary, but we do not feel that they get as much out of their work as other students who are able to stay at least one academic year. The adjustment for ordinary students takes about one term and for nurses who have been out of the country for some years, it is even more difficult to get orientated and to settle down to academic life.

4. *Lack of adequate information.* This seems to be one of the main difficulties. Nurses tell us that they are out of touch with facilities at home and do not always know where to go for information. They often fumble about wasting precious time, and sometimes make serious mistakes in getting located.

In reply to the question of ways and means by which Mission Boards and Educational Institutions might combine their efforts to

help this group of workers, the following suggestions were received:

1. Reduction in demands for speaking tours, etc., in the case of those who are eager to study, leaving most of the deputation work to those who do not plan to take courses during furlough.

2. Provision of scholarship or study funds to supplement salaries when necessary.

In regard to scholarships, I have very little specific information to offer. The Cleveland Branch of the St. Barnabas Guild offers one scholarship of \$500 yearly to a missionary nurse who is as a rule studying at Western Reserve University School of Nursing.

All scholarships offered in the Nursing Education Department in Teachers College are open on equal terms to missionary nurses, and in several cases special opportunities have been provided for such students. This is undoubtedly true of other university centers. Hospitals have been most generous in providing opportunities for experience with and without pay, and would probably do more if the needs could be presented to them through such a body as this.

3. Collection of all available information about practical and theoretical courses, also institutions or organizations willing to provide temporary positions for nurses on furlough, and a wide circulation of such material among nurses in different countries.

4. If possible, the appointment of a special nurse advisor whose salary might be shared by three or four mission boards. She would keep in close touch with the nurse missionaries and also with the opportunities in the professional field at home and would fit them together so that educational programs might be better planned.

A further suggestion which has come from several of those questioned is that the academic and professional standards of nurses going into foreign mission work should be certainly as high and if possible higher than the standards accepted in this country for responsible teaching and administrative positions in hospitals and public health nursing. Since the demands on these workers are so heavy and their potential influence so great, it is felt by many of the nurses themselves that the standard should be equivalent to that of college graduation with a diploma from a fully recognized school of nursing and at least one year of specialization beyond that. A sound education is needed not only because of the demands of the work itself, but because of the needs of the worker who in isolated districts is thrown back almost completely on her own resources and who, in her association with workers in other fields, feels the lack of the common cultural background of college education which most of them have enjoyed.

No one would venture to suggest that personal qualifications such as health, character, social spirit and personality, should be subordinated to educational and professional standards, but nursing requires knowledge and technical skill as well as goodness and devotion and the nurse in responsible positions everywhere needs leadership and vision and resourcefulness, which depend on superior intelligence and

education as well as on a pleasing personality and a self-sacrificing spirit.

Some of the nurses mention also more training on religious lines, in the study of the Bible and comparative religions, etc., and one mentions the "study of the oriental mind" which probably means a good course in psychology with special emphasis on racial adjustments.

So far as educational institutions are concerned, there should be no serious difficulty in procuring most of the things which these workers seem to need, either through university courses or through hospitals which admit graduate nursing students. Educational institutions must be willing to make some concessions for such students, who cannot always fit into their regular scheme of work, but they should not be expected to waive all academic requirements. We have had some applications from missionary nurses who evidently feel that they should be admitted as visitors at almost any part of the term without being held responsible for regular class work, that fees should be reduced for them and weak professional credentials not too carefully scrutinized. The great majority of those who have studied with us at Teachers College measure up well to the standards of the regular student group. It is a pleasure to see them blossom out under the stimulus of college life and the companionship of other nurses who represent all types of work and all sections of the country, with a number of students from foreign nursing schools as well.

Probably the greatest value in this experience comes, not from the direct class room instruction, but from the sense of comradeship in a common cause and the feeling of getting back again into the main currents of an advancing movement. It is this invigorating concept of progress, this inspiring vision of a world-wide sisterhood, which gives the isolated and often discouraged individual worker strength to go back to the foreign field again and tackle her difficult professional problems. The contacts she has made mean much to her when she is back at work again. We are constantly hearing from our students in the foreign field and exchanging ideas about nursing work which are of much value to us as well as to them.

One further suggestion is that the machinery of existing nursing organizations in this and other countries should be utilized as fully as possible in organizing educational opportunities for missionary nurses. Much has been done by these organizations already, but a special appeal to the Joint Boards of the American Nurses Association, the National League of Nursing Education and the National Organization for Public Health Nursing would help to focus attention more definitely on the problem. A committee might be established in connection with the International Council of Nurses to cooperate with missionary organizations in working out the problem on a broader basis. Our International Nursing Headquarters in Geneva already serves as a clearing house for many inquiries of this

kind, but its resources are much overburdened at the present time. I know very little of the existing resources of the Mission Boards, but I should feel that a greater centralization and specialization of this type of educational advisory work might be possible and that the appointment of a well qualified nurse to handle nursing education problems, to coordinate the efforts already made and to cooperate with these various nursing organizations and institutions, would be a measure of economy as well as efficiency.

Everybody is talking these days in terms of adult education. The furlough is a recognition of the need for continued learning as well as change and rest for workers in mission fields. In this respect the Mission Boards are well in advance of many educational institutions, which have too frequently assumed that education is finished when students have graduated from high school or college. Dr. Thorndike now assures us that there is no reason why we may not go on learning anything we want to learn, up to almost any age, the falling off in learning ability being so slight and so gradual as to present only a small handicap to the older student. With newer methods of teaching adapted to adult learners, and with smaller units arranged to suit the needs of part-time and short-term students, we should all have much less difficulty in keeping abreast with our rapidly changing times and in continuing our growth in spite of advancing years.

IMPORTANT MEDICAL PROBLEMS IN AFRICA

DR. P. H. J. LERRIGO

The outstanding medical problems of the African continent at the present time are outlined in the report of the Conference on Mission Work in Africa held at Le Zoute, September, 1926, entitled "The Christian Mission in Africa." The conference was divided into sections, one of which was devoted to medical matters, a period of two hours each day being set aside for discussion. The report of the medical section was the only one which was adopted at the final sessions of the conference without modification. It may be considered therefore that the topics upon which the greater stress was placed in these discussions indicate the more important medical problems to be found on the African field. These problems may be summed up under four headings, namely, health education, the creation of an African medical staff, the necessity for an international advisory medical board, and the advisability of cooperation in the attack on endemic and epidemic diseases. Of these problems health education and the creation of a medical staff will doubtless be covered in the remaining papers to be read this afternoon. The Le Zoute report indicates four major types of illness which should receive special attention throughout the African continent: tuberculosis, venereal disease, helminthiasis and trypanosomiasis. In the present paper, however, it will be possible to deal only with the

measures which might be taken for the control of trypanosomiasis.

An important finding of the medical section suggested the desirability of establishing an international advisory medical board "whose general task it shall be to survey the whole field of medical missionary work in Africa, and assist the cooperation of medical missions with Governments, with various philanthropic and scientific agencies, and with the League of Nations, in the campaign against disease." It was the opinion of physicians and other health workers present that cooperation in the attack upon Africa's outstanding physical scourges would make it possible greatly to reduce the ravages due to the diseases especially mentioned.

Prominent among the medical problems of Africa is trypanosomiasis or the African sleeping sickness. It is found broadly throughout the central and west African sections of the continent. The area of incidence includes Nigeria, the Cameroons, French West Africa, Congo Belge, Angola, Tanganyika and Uganda. It is stated that in the fifty years which have elapsed since Stanley's journey through mid-Africa hundreds of thousands of deaths have occurred from this disease and it is believed that sleeping sickness has been the major element in the reduction of the population of Congo Belge during this period from a probable thirty millions to twelve millions or less. In the areas where the disease is rife the incidence ranges from 12½% to 90% of the whole population. In an article printed in "Science" January 23, 1925, by Dr. Louise A. Pearce, two ways of combatting the disease are mentioned: "The destruction of breeding places of the tsetse fly which is the intermediate host of the trypanosome parasite which incites the disease, and the cure of persons already suffering from it." The former method has proved very successful in the few cases where it has been found practicable. It has generally been necessary to move the villages of the natives from areas adjacent to the tsetse breeding places in carrying it out. This was done on a more or less wholesale scale in Uganda with quite remarkable results. The disease was actually banished from the Protectorate. The record of progress was as follows:

Total of deaths from sleeping sickness in Uganda in	
1905 before the beginning of the campaign.....	8,005
1910.....	527
1915.....	3
1917.....	0

and there has been no recurrences of the disease since. It must be borne in mind, however, that the measures followed were rather drastic. It involved the entire migration of a people from one area to another accompanied by disadvantages which minimized in a degree the gain made. It is probable that this method would not be widely applicable to the control of the disease.

Most of the governments controlling countries where there are tsetse infested areas have made some progress in recent years in the study and control of the disease. It was recognized by the Belgians

long ago that one of the greatest battles before them in rendering their great colony habitable for natives and foreigners was the control of sleeping sickness. Government physicians at the medical centers at Leopoldville and elsewhere throughout the colony have been experimenting with the disease for two decades. A statement has been made that the native population of French Equatorial Africa was reduced from 12,000,000 to 3,500,000 in a period of ten years through this disease. The French Government has awakened to the peril of the situation and is conferring with the Pasteur Institute regarding the organization of an active campaign against sleeping sickness.

All the governments affected, however, have been somewhat nonplussed as to the type of effort which should be undertaken for the control of the disease. It has been recognized for years that the outlining of a campaign must depend upon the scientific factors involved in the problem. Perhaps the most promising and ambitious effort looking towards the ultimate control of sleeping sickness is the organization of a joint International Commission under the leadership of the Health Committee of the League of Nations. This Commission was sent to the field in 1926 and after working for a year its period of service was extended for six months more, terminating on June 30th, 1927, when the Commission disbanded. The Commission was under the direction of Dr. H. Lundhurst Duke. Associated with him were specialists from cooperating countries including Drs. G. Lavier and M. M. Prates from France, Dr. M. Peruzzi from Portugal, Prof. F. K. Kleine and Dr. Van Hoof from Belgium. Their effort was a limited one. It was planned to investigate certain of the outstanding epidemiological and biological problems involved in the disease. Special departments of the work were committed to the individual members of the Commission and important reports were rendered the nature of which may be judged from the following titles: "A series of studies of the bionomics of the polymorphic trypanosomes of man and ruminants," "The possible chemotactic influence of the salivary glands of Glossinae in the development of the polymorphic trypanosomes," "Seven papers dealing with an atomopathological and serological observations of trypanosomiasis," "The epidemiology of sleeping-sickness in G. palpalis and T. gambiense regions." It was hoped that as a result of the investigations carried out by this commission it would be possible to outline an effective method for the control of the disease. The following recommendations were made by the Commission:

The movement of natives ought to be controlled.

The census of infected natives ought to be thorough and complete.

Natives infected with trypanosomiasis ought to be treated.

The evacuation of heavily infected zones should be carried out.

The reports which have been rendered by the International Sleeping Sickness Commission from time to time have made it clear that in any plan which may be proposed for the control of sleeping

sickness in Africa one of the greatest needs will be for a trained personnel to conduct the work. The reports have referred several times to the paucity of physicians and health workers equipped to lead the effort in various parts of the continent where sleeping sickness is prevalent.

It is at this point that the evangelical missions working on the continent of Africa may be able to render inestimable assistance in any concerted effort which may be proposed for the control of the disease. Following upon the conference on Africa which was held in Le Zoute, September, 1926, a small group from the Africa Committee of the Foreign Missions Conference began to study the possibility of bringing about and arranging the details of some such plan. The Africa Committee finally presented to the Committee of Reference and Counsel a memorandum with certain recommendations which were adopted and submitted to the constituent North American Boards. This memorandum is of such importance that it is quoted here in full:

In the findings of the Le Zoute Conference in Africa, under the heading of "Health and Native Welfare" African sleeping sickness was suggested as one of the diseases especially requiring attention in the promotion of a health program for the continent. A small group from the Africa Committee, with the coopted help of two Board Medical Secretaries, has been studying the possibilities of a comprehensive concerted program of attack on this terrible disease. This has been envisaged as a great cooperative international undertaking, with Missions operating in conjunction with the various European governments concerned in a definite campaign in the affected areas. Such a conception has such possibilities that it has seemed worth exploring.

The question is therefore whether at this point the Mission Boards are prepared to follow up the recommendations of the Le Zoute Conference with some fairly concrete program looking toward joint action and in definite cooperation with the European governments concerned, on plans based upon the recommendations of the Commission of the League of Nations.

At this stage of the discussion it would be well to review certain factors in regard to the disease and then to outline the suggested program proposed.

I. It may be said first that the objectives we have in mind are twofold—

- (a) Reduction and control of trypanosomiasis.
- (b) Demonstration to the governments in Africa, as well as to the constituencies at home, of the genuinely humanitarian purposes and capacities of the Missions.

II. The reasons for focusing upon this one disease are as follows:

- (1) Among all the great endemic diseases afflicting Africa trypanosomiasis offers at the present time the greatest

promise of success resulting from a combined attack. The British have cleaned up some areas completely.

- (2) The incidence of the disease is confined to definite areas in Tropical Africa. These are (1) Nigeria, (2) Cameroons, (3) French Equatorial Africa, (4) Belgian Congo, (5) Angola, (6) Uganda, (7) Tanganyika.
- (3) The mortality of the disease is so pronounced as to threaten depopulation in a number of areas. The incidence is from 12½ to 90% of the whole population in some areas.
- (4) The governing powers in the areas concerned are cognizant of the menace of this disease and would be disposed to welcome cooperation in its suppression.
- (5) The nature of the disease and its method of transmission have been explored to such a degree as to indicate the methods which should be used in combatting it.
- (6) At least two very effective drugs have been elaborated which give great hope of ultimate success.
- (7) A delegation from the Health Commission of the League of Nations is now studying sleeping sickness and other conditions in Uganda and other sections, and will be prepared in all probability with information and suggestions which would be available in carrying out a concerted attack upon the disease throughout the whole area of Tropical Africa.
- (8) The missionary organizations working in the various provinces are already equipped with a trained personnel, both foreign and native, who would be prepared to serve as active agencies in combatting the disease.
- (9) Government physicians with their trained assistants are also prepared to deal with the condition in many sections.
- (10) It is believed that in a period of five years a combined and vigorous effort would result in reducing the incidence to the point at which it might be readily coped with by the ordinary health organizations of the various areas.
- (11) Success in this task would prove an encouragement to the undertaking of campaigns requiring a more serious and long continued effort against other endemic diseases in Africa such as tuberculosis, venereal disease and helminthiasis.
- (12) Success in such a clear-cut piece of health work would be a stimulus to government and health organizations the world over to undertake similar campaigns against other physical scourges.

III. Granted a knowledge of the disease, which is now being made more fully available, and an effective drug for the disease, the great factors to be considered are the allocation and mobilization of per-

sonnel and the obtaining of funds for the purchase of the drug in ample quantities.

IV. As to funds, it is not proposed to ask these from the Mission Boards, but it is expected that the International Organization responsible will secure them from governments, foundations, or individuals.

V. The problem for the Mission Boards has to do with the provision of personnel for the effective carrying out of the plans agreed upon.

In this connection certain points should be brought out:

- (1) A comparatively small personnel can handle a very large number of cases.
- (2) There is a not inconsiderable number of Mission doctors available.
- (3) Whatever measures are decided upon it is altogether probable that lay services could be used effectively under the guidance of the physicians.
- (4) If the service of the Mission workers were to be offered in such a campaign it would be understood that they would be utilized within their own areas. There would be no shifting about of personnel outside of their own fields. Inasmuch as Mission physicians are already engaged in this work our program is really an extension of what has already been under way.
- (5) Only a few Boards would be involved, because of the known geographical distribution of the disease.

The general idea would be to see what arrangement could be worked out by which some portion of the time of doctors, nurses, and lay people could be assigned to such a cooperative campaign and about what total of workers and also what equipment, such as is represented in Mission hospitals and dispensaries, could be made available. The difficulty of asking the Boards to draw up any concrete and parallel proposals along these lines before January is realized. We would recommend, however, in view of the urgency of the situation, the psychological moment of the League's attention, and the relative practicability of a successful campaign, that most careful attention be given to formulating some definite united program to be submitted by the International Missionary Council, speaking for the Boards, to the League of Nations Commission at its January (1928) meeting.

The Africa Committee therefore recommends to the Committee of Reference and Counsel that its secretaries be instructed to send copies of the above report to the North American Boards concerned and ask these Boards to reply to the following questions:

1. Assuming that the International Conference to be held probably in January, 1928, will recommend a plan of united effort, will the Board addressed give favorable consideration at that time to an invitation to cooperate in the carrying out of the measures recommended?

2. If so, will the Board addressed advise its Mission or Missions in Africa and instruct the missionaries—both medical and non-medical—to make this campaign a major part of their program of work for a limited period of years, not to exceed five years in length.

Since the preparation of the memorandum here given a number of the leading mission boards carrying on work in Central Africa have expressed their willingness to join in a plan whereby the missions should cooperate with government in the attack upon sleeping sickness. The details of such a plan will need to be worked out very carefully and doubtless the leaders in the various governments joining in the Sleeping Sickness Commission already referred to will in their final report indicate the direction which such a plan should take. It is not too early, however, for the medical leaders in our various African missions to begin to think through the details involved in the problem and to lay plans for such cooperation as they may find it possible to lend.

To achieve success in the effort to control sleeping sickness will require vigorous and long-standing effort. Such an effort ought certainly to enlist the cordial support and complete cooperation of all the organizations carrying on work in the area affected. The difficulties to be confronted are not minimized, but it is felt by many of those who know the situation most intimately that an effort to control sleeping sickness offers a better hope of prompt success than attack upon any other of the outstanding endemic conditions met upon the continent of Africa. The carrying to a large measure of success of such a plan would encourage medical workers and government bodies in Africa to undertake subsequently the control of other serious physical scourges such as tuberculosis, venereal disease, etc.

MEDICAL EDUCATION IN AFRICA

DR. J. B. McCORD

If we except appendicitis and cancer, the people of Africa seem to suffer from much the same diseases that we find in the temperate climate of the United States. They have, in addition, many diseases which are peculiar to tropical climates.

Except in a few small areas, which might be represented for the most part by fly specks on the map of Africa, there is no public health work done, no sanitation and no knowledge of the cause of disease or its prevention. This will account for the great prevalence of disease among a people who have, naturally, a very rugged constitution. Add to this the fact that there is no one among them who has knowledge of the nature of disease or of its rational cure, and one wonders why there is not even more sickness than there is.

Africa has an area nearly four times the size of the United States and a population of about 140 million. There are nearly 140 missionary physicians in Africa, an average of about one physician to a

million of the population. One to a million! The city of Detroit has a thousand physicians to a million of its population. One office building in Detroit furnishes offices for more physicians than there are missionary physicians in the whole of Africa. It is physically impossible for the missionary physicians in Africa to attend to the medical needs of more than about one per cent of the people there.

There are, however, other doctors in Africa. There are cities, especially along the coast, and surrounding districts settled by white people, where there are white physicians. Some of these white physicians attend the natives in their immediate vicinity. The number so attended is very small.

And then there is the large number of doctors from the ranks of the natives themselves, indigenous doctors, as you might say. The native doctor has no education, he cannot read and write, but he is no fool. He is a shrewd student of human nature, he knows of the power of suggestion, his father has perhaps instructed him how to practice medicine most successfully, he may even know the more obvious effects of some of the herbs at hand. He surely knows, or thinks that he knows, magic properties of a large number of substances.

The native doctors have a theory of the practice of medicine. The following account of "The Native Doctors—How They Treat Disease" was given to me by an intelligent Zulu. In translating I have tried to preserve the native idiom and at the same time make sense in English. He says:

"A sickness which is in the body is treated thus:

"A fever is cured by medicines made of green herbs. A fever which is causing a hot pain inside the body, similar to the pain caused by an eruption or inflammatory condition of the skin on the outside, is best cured by a bitter medicine. Isibara (that is, the bark of a certain tree) should be mixed with Katazo (this is the bulbous root of a small plant), and with Ndaluqwatu (another root) and with Ndungulu (another kind of bulb) and with green herbs such as Xaposi (an herb) and Boza (a tree). The bitterness of these medicines will cure the fever. When these medicines have been properly compounded, they should be mixed with water and taken with a spoon as often as desired.

"Another fever is caused by biliousness. In this case it is necessary to cause vomiting with emetics, which will remove the bile from the stomach.

"The severe sickness in the body and in the blood are cured by medicines which are strong and powerful, mixed with the flesh and fat of beasts.

"If the blood comes out of the body through the nose or the mouth, it is necessary to take the bark of trees which have juice like blood, and parts of an animal which bleeds readily when touched, and parts of an animal which has much blood in its body. These are mixed together and then the blood of an animal like a goat is mixed

with them. The blood of the goat destroys the poisonous properties which the mixture would otherwise have. The whole combination is then burned and the ashes made into a powder. This powder is divided into three parts. One part is to be taken internally. A second part is to be put into a dish which has been heated over the fire, a little water is added and the patient is then to quickly touch it with the fingers of the left hand and lick the medicine off the fingers. Then he is to do the same with the right hand, and so alternately until he has taken all the medicine. A third part is to be introduced into the body by making cuts in the skin and rubbing the medicine into these cuts. It thus goes into the body directly. The tree from which this powerful medicine is obtained is the Umdlebe tree—which bleeds blood—and is found in Gazaland. Another such tree, the Ugazi, is found in Swaziland. These are the trees which are mixed with the animals which have much blood.

“Another sickness in the body is treated with the fat of animals and with their flesh. If a person is sick with nervousness and fear, it is necessary to take the heart and eyes of a lion, also its fat, also the fat and flesh of an elephant and the fat and flesh of all powerful animals, these to be mixed with the bark of many kinds of trees. The part of the animal preferably taken is the part which is just below the chest, where one feels the palpitation of the heart. There should be mixed with this combination the blood of a cow or sheep, and the whole burned and made into a powder. This is a powerful medicine to be taken internally. Also it is very efficacious if rubbed into the body through holes cut in the skin over a painful spot. The lion is put in on account of its strength. It prevents the disease from growing in the body. A python is put in to keep the disease in one place to prevent its spreading, because a python holds anything tight together. The fat of animals is put in to increase the other beneficial properties of the medicine and to make it more powerful.

“If a man wishes to become great among his people, to be respected and feared, he pounds up certain stones which are very heavy in weight, and mixes them with fat. He also puts in some quicksilver. He anoints his face with this medicine. He also puts the eye of a lion or the eye of a large snake into the mixture. This makes a medicine which gives a man great dignity and makes him to be feared. The doctors mix up these medicines and say that the mixture gives a man a powerful personal appearance and that, in the presence of this medicine and its effect, diseases in the body are overcome.

“If a person has broken his leg, don't cut it off. A small bone of a dog should be tied on the leg until the bone is united. That is the treatment of a broken bone.

“Another treatment for a broken bone is to take the roots of the umtombi tree—not the roots in the ground, but the roots hanging down from the branches—also take the trunk of a banana tree; also take some other trees which, when cut, do not dry up, but sprout out

quickly. The name of such a tree is Umahlokolozzi. This medicine causes swelling and then draws out the pus from the sore.

"Also take acid stones, such as blue stone, and a white stone, such as is used in mending buckets, and grind them up into a powder and rub them into the body through holes cut in the skin over the injured part. The stones cause some pain. All these medicines go straight to the injury and cause the bones to unite.

"For the disease which causes twitching of the flesh and spasms of the body it is necessary to get twitching medicines. Some animals are good for this kind of medicine, such as the Imfingezi—a small beetle like insect which, if touched, curls up into a small ball; and the Zifisi, an animal which, if touched, pretends to be dead; also some animals from the sea which act in the same way, which roll themselves up and pretend to be dead when taken out of the water; also worms; also trees and plants which if touched fold up their leaves. These plants and the flesh of these animals make medicines which cure the twitching diseases and spasms. They are taken internally and rubbed into the body through holes cut in the skin.

"In all these diseases it is necessary to use medicines for vomiting and medicines for enemata, while the other medicines are being used.

"This is the way native doctors cure disease."

I one day bought a number of medicines from a native medicine seller. The following is a list of fifteen of these medicines, what they are good for and how they are administered:

1. *Matunga*. A bulb. This is used as a remedy for consumption. It is also used as an emetic. One half of the bulb is ground up and mixed with a tin of condensed milk, and administered.

2. *Imamba*. This is a deadly snake. Its dried body is used. A small piece is charred and ground to a powder. An amount the size of a pinch of snuff is taken as a dose. If a person has been bewitched, especially by medicine that is smelled or by medicine which has been put in the path and which the patient has walked over, this powder made from the dried body of the imamba is very efficacious in curing such a person.

3. *Imbedhla*, the dried body of a lizard. This is used in the same manner as the dried body of the imamba, that is, for curing a person bewitched by medicine drunk or walked over.

4. *Mboziweni*. This is a bark used in combination with imbedhla. Pieces are chipped off and charred and ground to powder and mixed with the powder of imbedhla and used as a snuff for sickness due to witchcraft from medicine put in the pot.

5. *Isihlungu*. This mixed with matunga is good for the imamba bite. It is chipped up with matunga and cooked in water and the bitten person takes a teaspoonful three times a day. If the bitten person takes this medicine faithfully for two weeks he need no longer fear the immediate effects of the bite of the imamba. (Note: The imamba bite is usually fatal within the hour.)

6. *Isibara*. Pain killer. This is used with matunga and isihlungu for the treatment of consumption. They are ground up together and mixed with water. The patient takes a tablespoonful three times a day.

7. *Ibunga*. This is used with the prepared body of a snake for treating a person bewitched by drinking or walking over medicine.

8. *Imbedhla*. The dried body of another lizard.

9. *Inhlamva*. A nut.

10. *Impisiyihlangula*. A piece of bark.

11. *Ngobandhloru*. The stem of a small plant.

These four substances, 8, 9, 10 and 11, are used together. A piece of each is taken and the whole charred and ground to a powder. This is then mixed with the blood of a fowl or an ox. It is then put into water and taken internally. This is very efficacious in curing Iqondo, a native disease. This is supposed to be a bladder disease contracted through immoral practices.

12. *Crocodile skin.* A small piece of this is pounded until it is soft and put into a cough mixture to increase its efficiency.

13. *Cuttle fish.* This is powdered and put into the eye for any eye disease.

14. *Feathers and skin of a vulture.* This a cure for insanity. Char a little of the skin and feathers and grind to a powder. Mix with mboziweni and insangu seed. Powder the whole and mix with water and salt. Dose, a half teaspoonful once a day.

15. *Inhlali.* Skin and quills like that of porcupine. For hiccough. This is charred and ground to powder and mixed with a certain powdered bark. This is mixed with water and taken a teaspoonful four times a day. This is also worn for luck like a rabbit's foot.

It must not be supposed that the native does not have any powerful medicines at hand. He certainly does and he uses them in a powerful manner. "If a small dose does good a large dose does more good" seems to be their motto.

The late Rev. F. B. Bridgman of Johannesburg has given me the following incident: "In Zululand, on one occasion, I arrived at a place where a girl of 16 or so had died suddenly an hour or so previously. She was ailing and had been administered an herbal potion. She dropped dead soon after. The supposition by the natives was that she had been given an overdose. Certainly the circumstances seemed to indicate that. After taking the dose she had gone to the river and died there."

Before the Native High Court, March 25, 1914, was heard the case of Gavana. A native woman, Nonkani, had been dreaming. Gavana professed to be a doctor and made a medicine for her from isindiyandiya. The medicine was given to her at 5 A. M. and she died at 6 A. M.

The Rev. Johannes Astrup, of the Church of Norway Mission, gives me the following case: "I have one native boy here who had brain fever when he was about eight years of age. The stupid ass of a doctor filled his ears with some poisonous stuff which destroyed his ears so that he is deaf as a door post and partly dumb."

When we consider the native doctor's complete ignorance of physiology, pathology, and the indications for treatment, we can readily comprehend that the more powerful the medicines he has at his command, the more dangerous he becomes.

Does a native doctor ever do any good to his patient outside of suggestion and counterirritation? Possibly so. I have never seen a case in which he did.

In surgery the native doctor is not so bold as a rule. His surgical operations are, for the most part, confined to skin incisions for the rubbing in of medicines, or cutting down on the skull and scraping the bone for the cure of headache. Occasionally they will undertake more extensive operations—with uniformly disastrous results.

It is in childbirth where we get the most mournful results of the

native doctors' practice. There is prevalent a very general belief that women who live near to nature go through labor without complications and without danger and with little or no suffering. My experience among the Zulus leads me to a very different conclusion, and I think that the same conditions are prevalent throughout Africa.

I have had many cases in my own practice where patients have been in labor for a week or ten days, and I have been called when the patient was at the point of death, too late to save life. I have had hundreds of cases where the patients would have died in childbirth if they had not had help. I have heard of hundreds more who have died without help in the country, without help or with only the attentions of the native doctors or midwives. I have had multitudes of cases of vesico-vaginal fistula due to lack of attention or to cutting operations at the time of delivery—cases which have come to the hospital for the repair of the fistula. I have seen many cases where the parturient canal was obliterated by cicatricial tissue due to the same cause, cases which would surely die in subsequent labors if left to the native doctors or midwives. I have had many Caesarian sections in the hospital due to this cause. The number of deaths and cases of invalidism among the natives of Africa resulting from childbirth is appalling.

The native doctors and midwives have various methods of assisting at a case of labor.

I have had reported to me many cases of cutting operations by the native doctors during childbirth. He uses a knife or the blade of a spear or a piece of broken bottle. Fatal results often follow, the frequency depending on the thoroughness with which the doctor has done his work.

In cases of delayed delivery it is a favorite practice of the native doctors and midwives to cut up the child and remove it piecemeal. This procedure is often disastrous to the mother, always so to the child. A white doctor in Natal reported a case in which the native midwife undertook to so cut up a child. She cut off a foot and was proceeding to also cut off the leg when the father interfered. The child was born and is healthy, but is minus a foot.

In the Ixopo division a man complained to the magistrate that the native doctor was charging him too much as his wife had died. The evidence showed that the woman was having twins. The first child had been born normally, but the second was slow in coming. The native doctor was called in and proceeded to operate with a large knife. Examination showed that the doctor had cut away a large piece of the uterus.

I had a case of my own in which the midwife tried to remove the uterus thinking that it was something that ought to come away. At each such attempt the woman fainted. The midwife was somewhat faint-hearted so she sent for the white doctor. All that was necessary was to replace the uterus in its proper position and all was well.

Such cases might be multiplied indefinitely, but it is not necessary. It is really a deplorable state of affairs for the native women of Africa. But what can you do? There are very few of the people of Africa who are within reach of a trained doctor in case of emergency, and most of those who are within reach do not know enough to go to him.

The native doctor in Africa, however, is more than a mere medical practitioner, and sickness is more than a mere departure from normal health. The native doctor, the herbalist, is also witch doctor, and the sickness that he treats is the result of witchcraft and must be treated by magic and charms. Most of his medicines owe their supposed potency to their supposed magic properties.

I quote from an article which appeared in the *Missionary Herald* some years ago from the pen of the Rev. Thomas Woodhouse, of the West Central Africa Mission of the American Board: "The African witch doctor is found everywhere throughout the Dark Continent. His influence and power are to be reckoned with. Chiefs and headmen obey his mandates. Often in his hands is the power of life and death. He is not an ignorant, inexperienced savage, but has served an apprenticeship of some years. He knows herbs and he knows poisons, he is a sleight-of-hand performer; he is self-confident and at times arrogant. He is ever in demand, not only in cases of sickness but more particularly in cases of death. He is called, not to restore the dead but to determine the cause of death and to point out the person who caused it. With the African there is no such thing as a natural death; every person who dies has been killed. It is the function of the witch doctor to discover the guilty person."

This belief that all sickness is caused by witchcraft and that the witch doctor can discover the one who has done the bewitching and can give counter magic for the cure of the witchcraft, gives the witch doctor almost unlimited power among the people of Africa. His power to point out the guilty party makes him the prosecuting attorney, the jury and the judge all in one. In the olden days the person so pointed out as the guilty one was immediately taken out and killed. There was no appeal. Even today, in Natal, under a strong British Government, the person so pointed out is often killed, even though such killing is classed as murder. Such a case recently came under the notice of Dr. Morledge, my associate, where a boy was barbarously murdered by his friends and relatives because he had been pointed out as the one who, by means of witchcraft, caused sickness in the kraal.

The Hon. Justice C. G. Jackson, of the Native High Court in Natal, in an article in the *South African Journal of Sciences* for January, 1917, narrates fifteen cases where natives have been killed in recent years because they were suspected of causing sickness or death by means of witchcraft. He also adds six cases where people have been killed that the witch doctors might cut up their bodies in

order to get parts of the human body with which to make magic medicine. Fat from the human body, if the victim has been properly killed, is the most powerful ingredient of all for the making of magic medicine.

It is not only in cases of sickness where the witch doctor and witchcraft are influential. They profoundly influence every walk in life among the people of Africa, socially, politically and religiously. Witchcraft is really the religion of Africa, the only religion, and the witch doctor is the great high priest of this religion. Practically every heathen, barbarous and immoral custom in Darkest Africa is closely associated with witchcraft, sanctioned by it and usually originated by it. The natives of Africa are afraid to break away from witchcraft for fear of the calamities that may befall them if they do.

It is my opinion that the witch doctor and the witchcraft that he represents stand as the greatest obstacle there is among the Africans today preventing their acceptance of Christianity and retarding their advance in civilization. Allow me to quote a few opinions from a multitude of similar expressions of opinion.

The late Rev. F. B. Bridgman, quoted before, stated, "As witchcraft springs from ignorance and superstition, being the ready tool of revengeful hate, it is in every way antagonistic to the progress of the native, religiously, morally and intellectually."

The Rev. F. Suter, of the South Africa General Mission, says, "As to the influence of witchcraft, which of course includes that of the witch doctor, there can be no question, the tendency is to keep the native in the blackest of darkness in every respect."

The Rev. Johannes Astrup, quoted before, of Untunjambili Mission Station, says in regard to witchcraft and witch doctors that they "engender superstition to an incredible degree, rudely and barbarously destroy the last remnant of decency and modesty in wives and daughters, and envelop the intelligence in a perfect maze of lies, deceit and folly. I could tell many weird and shocking stories about their stupidity, barbarity and bestiality."

The Rev. Fehling, of the Mt. Tabor Mission Station, Zululand, says, "In my opinion the real rulers of the natives are the witch-doctors." And again, "This one thing I am sure of, that as long as witchcraft and witch doctors govern the hearts and minds of these people there can be no real progress religiously, morally or intellectually."

The Rev. John Hawkins, of Lansdown Mission Station, Zululand, says: "Both the herbalists and the witch doctors are the greatest hindrances to the gospel and uplift of the people, for they literally have the Zulus completely subject to them. They are an awful curse."

The Hon. C. G. Jackson, quoted before, says of the great Bantu race occupying the central, eastern and southern portions of Africa, "Customs and beliefs may and do vary largely in different Bantu

tribes, but the belief in magic and witchcraft is general and admits of no variations in its essentials." And again he says, referring to the fear of witchcraft, "It is the inherent dread of the unknown and the illimitable power of witchcraft which creates that fear,—the power to blight the home, to cause sickness and death among its inmates, to bring disease into the herd; a power held accountable for every untoward incident. State intervention, civilizing influences, and missionary endeavors have not yet sufficed to dispel this belief, scarcely indeed to pierce it."

In this connection I would also quote Mr. Justice Hignett of the Native High Court in Natal. As he was pronouncing sentence of death on two natives who had just been convicted of murdering a man for the sake of parts of his body for making magic medicines he said: "It was an established fact that superstitious natives believed in the occult power of those arch rogues, the witch doctors, who claimed occult powers and imposed on the credulity of their more ignorant countrymen." Mr. Justice Hignett described the effect produced by the witch doctors on the suspicions of the common natives and said that there was no greater curse on the country native than that sect of natives who claimed supernatural powers.

The great problem before those who are working for Africa is, "How can we get rid of the witch doctor in Africa?"

But so long as the people of Africa have sickness in their kraals, they must have their doctors.

So long as the witch doctor is the only doctor available they will have the witch doctor, and he will retain his power and influence over the people.

We will never make great headway in Africa until we get rid of the witch doctor, and we will never get rid of the witch doctor unless and until we can give the people better doctors in his place. The 140 missionary physicians in Africa are doing good work, but the work that they are doing is hardly a scratch on the surface compared to the work that needs to be done, that must be done before we can hope to get rid of the witch doctor. We need ten thousand doctors at the very least, and then we will want more and ever more.

It is hopeless to think of ever meeting this need by sending missionary physicians from America or Europe. We couldn't find the men who would go and we couldn't support them if we could find them.

The only practical way to meet this need, and meet it in an efficient and permanent manner, is to take the more advanced among the natives themselves and give them a good medical education and training and send them out to carry on the work among their own people. The native doctors, well trained native doctors, could live among their own race and make their own living, and would not need to be supported from America or Europe. When once well started this plan would be self-perpetuating.

The native African is capable of receiving, absorbing and utilizing a medical or other higher education.

Anyone who has ever met the late Dr. Aggrey, a West Coast native, can easily believe that he, at any rate, has ability which no white man could despise. He was not a medical man, but rather an educator.

Dr. John Nembula, a Zulu, went to the Chicago Medical College and graduated in 1891. He went out to Natal and engaged in medical practice, acted as district surgeon under government appointment and was most highly spoken of by both white and black as an able physician and polished gentleman.

Dr. S. M. Molema, a South African native, is a graduate of the Glasgow University. While in Great Britain he wrote a book on the Bantu people and their language which was published there. He has a large white as well as native practice in Mafeking, and is recognized as one of the ablest physicians there.

Mr. Motebang is a native of South Africa. His father was a Presbyterian minister. He was trained at the South African Native College and the Edinburgh University, where he graduated in 1925. He is a man of sound character, and his practice is among the natives, Indians and colored people.

Dr. Malangeni is a Fingo. He lives in the Transkei territories and has been practicing for ten or twelve years, among the natives. He qualified in Canada and Edinburgh.

Dr. Moroko is a native, and is a graduate of the Edinburgh University. He has a large practice in a native district on the border of the Orange Free State.

Dr. Sebeta, a native, was trained at Edinburgh. He is practicing in connection with the government hospital at Maseru, Basutoland.

Dr. A. B. Xuma is a graduate of the Medical Department of the Northwestern University, where he was very highly spoken of by the Dean. He has obtained British qualifications in Edinburgh and has but recently gone to South Africa to engage in the practice of medicine.

These are concrete examples of members of the native races of South Africa who have made good. They are not exceptional natives. There are many thousands of others who have the same ability. I speak from personal knowledge of the Zulus. I believe that the same will apply to most of the other tribes of Africa.

We have been urging and clamoring for a medical school for the natives of Africa since 1917. Permit me to quote from an article from the pen of a native which appeared in the *Johannesburg Star* for May 17, 1927:

"That there is a crying need for trained native doctors among the native population no reasonable man can deny. Broad-minded Europeans have been urging the authorities to provide for medical training of natives. Nor is this all; some attempts were made at

Durban by the American Board Mission to establish a medical training school for natives.

"It is recognized by those interested in the welfare of this country that to combat not only disease among native people, but also the evils of superstition, trained native doctors are urgently needed. It was because of this crying need that the Government appointed, about two years ago, a commission to inquire into the question and report. And it is to be hoped that, as the result of this inquiry, the Government will find it their bounden duty to establish a medical school for natives."

What is being done for the medical education of the natives of Africa? Very little. What is going to be done? Much, we hope.

In 1921 Dr. Taylor, my associate, and I organized a class of half a dozen native young men for the study of medicine. We could not hope, single-handed and with our very limited facilities, to give them a full-fledged medical course, but we were determined to make a start and do what we could.

About three years later the South African Native College decided to introduce a medical course into their curriculum equal in every respect to the medical courses in the British universities. As this was a much more ambitious plan than I could ever hope to undertake, I had a conference with my medical students and sent them all down to the South African Native College, paying their expenses.

The South African Native College could offer only the first year of the medical course. After that the students would have to go to Great Britain to complete their course. The South African Native College was hoping to offer the entire course in South Africa later. She is still hoping. A fully equipped medical school costs a lot of money, and the South African Native College does not have a lot of money, though she is perfectly willing to have.

At the request of the South African Native College a commission was appointed by the Government two years and a half ago to take evidence and report on the need and feasibility of providing for the medical training of the natives. This commission had not made its report when I left Africa. The report will doubtless emphasize the very obvious need for training native doctors, but will fail to indicate where the funds can be obtained for carrying out such medical training. If the funds had been available, the commission would not have been necessary.

But the investigation and report of this commission apply only to the Union of South Africa, a small area not so large as the United States east of the Mississippi. What we need is doctors for the whole of Africa right up to Egypt. Perhaps South Africa is the logical place for a medical school for the natives of the whole of Africa. Perhaps we should have medical schools in different parts of the continent. That will probably come ultimately. But the first medical school must start somewhere, and South Africa, with

its temperate and healthful climate, fine race of natives, and schools carrying the natives up to matriculation and on to the degree of Bachelor of Arts, and one school which has already begun a medical course, seems the logical place to make the beginning.

Medical work is the key to unlock Africa.

The unlocking must be done by a large number of well trained, Christian, native doctors, living among the people.

THE UTILITARIAN TYPE OF MEDICAL MISSIONARY WORK

DR. HENRY S. HOLLENBECK

The tropical world of today is witnessing development on such a scale as has never been known in the past, and the rapid progress that is being made in many remote places received much of its impetus from the great advances which have been made in the field of scientific medicine. Particularly in that part of it which comes under the head of tropical medicine. In this field medical missions have made important contributions in both the practical and scientific phases. It can be said without fear of contradiction that, without its medical ally, the present commercial development would be impossible yet this fact is given too little recognition outside of medical circles.

Many serious discussions of the reasons for the backwardness of the races living in the tropics in general, and in Africa in particular, are undertaken with only the most casual reference to the important part played by tropical diseases. One often sees enumerations of the reasons for the long delay in the occupation of tropical Africa by European nations, which do not include disease as one of them, though it deserves a place among the most important.

The health problems of tropical Africa, as pictured in the preceding papers, are so huge and the available resources are so limited that it will be well to make brief reference to the historical setting in order that the picture may not be so dark as to be utterly discouraging.

Disease has always taken a heavy toll from those who attempted to enter tropical Africa, whether adventurers, settlers, or missionaries, and has ever been a great hindrance to missionary work by claiming the lives of many new recruits and by shortening the lives of prominent leaders. The West Coast was one of the earliest fields of missionary effort in tropical Africa, and the records show a particularly long casualty list. The health risk there was so great that it came to be familiarly known as the "white man's grave." While traveling on the West Coast a few years ago it was my privilege to visit a station of one of the old missions at Christiansborg in the Gold Coast. After seeing something of the work of the mission, we went to the cemetery adjoining the mission. Cemeteries are a

telltale adjunct of all long-established missions in Africa. And how much pathos there is in their story! In one section of the cemetery we saw a row of tombstones all erected in the same year. Our comment brought out the explanation that years ago six missionaries had come out together to join the mission, and one after another they had fallen sick and died, and within six months they were all laid away in the cemetery side by side.

Early commercial enterprises were also very costly in human life. Figures are lacking to show the full extent of the losses, but they were often appalling. It is said of one of the early railroads of Central Africa that its construction cost a human life for every tie that was laid.

Recent advances in the knowledge of the causes and of the treatment of tropical disease have brought about great changes which now make it possible for Europeans to take up residence for varying periods and carry on their work, without serious risk of life, even in West Africa.

Yellow fever, which used to be such an important factor in the death rate, has been brought largely under control and may soon be entirely stamped out. The danger from pernicious malaria has been greatly reduced by supplying the knowledge of the way to avoid it and by improved methods of treatment. The same applies to hemoglobinuric fever.

Practical methods of dealing with Tripanosomiasis have been worked out, and a cure for the disease in its early stages has been found. The plans for the proposed international attack on this disease have already been outlined in a previous paper.

Even the age-long scourge of leprosy has been successfully attacked, and a cure has been found. Thus this universally dreaded disease, which has so long been styled the living death, seems to be nearing the time when, by concerted action, it could be eliminated from the list of human ills.

The writer went to Africa in 1909 to join the mission of the American Board. It was an inland mission, with no station at the coast. There were no roads, and the only way to get to the interior was over the native trail. He was told of the difficulties of the trip and of the hardships experienced by some of his predecessors. Many of them had been stricken with fever after a few days and not a few had died by the way. Equipped with current knowledge of prophylactic measures, he undertook the journey on foot with native porters and was able to complete the eighteen-day trip without suffering from fever.

Let it be said here parenthetically, as an indication of the progress that has been made, that there are today many good roads with automobiles using them and that eight hundred miles of railroad have been constructed through this region and it is now possible to make the same trip to the interior either by auto or by rail. The Government has medical officers at the principal European settle-

ments. Our mission now has three medical men and a fourth is under appointment.

Pernicious fever was common at that time, and the mortality was high. Very few Europeans were able to remain very long without contracting it. Hemoglobinuric fever was also common and highly fatal. In the course of a few years the situation was radically changed by the adoption of the use of prophylactic quinine and of mosquito nets. The general mortality has been markedly reduced, while within our own mission circle there has not been a death from any tropical disease during a twenty-year period. In the immediate vicinity of the mission stations there has been a marked reduction of the virulence of malaria in the African people.

The tropical countries today constitute the world's great storehouse, and herein lies one of the reasons for the importance of tropical medical work in general and of medical missionary work in particular. In tropical Africa both the natural resources and the people have been held in reserve, as it were, for future use. The natural resources of Africa in many respects exceed those of America. We have exhausted all the superlatives in describing America. How shall we describe those things in which Africa excels? The resources and possibilities of those huge areas of arable land, of that high degree of fertility peculiar to the tropics, make accurate comparison difficult. A relative index of the comparative resources of Africa and America may be found in a comparison of Victoria Falls with Niagara. Victoria Falls are two and a half times as wide and twice as high as Niagara.

It must be remembered that the latent possibilities of tropical Africa cannot be made available without the help of its native peoples. Those of us who are working among these people are finding surprising latent abilities, which in some measure parallel the great latent possibilities in natural resources.

These abundant resources are so much needed in our modern development that Africa seems at last about to begin to play its destined part on the world's stage. The successful carrying out of commercial ventures which are being undertaken, such as that of the great river plantation in Liberia, will help to establish Africa in its rightful place among the continents.

Medical missions, through their pioneering work in many fields, have played a prominent part in preparing the way for all such ventures. They have performed valuable services for governments and the agents of commerce, and are still doing so. It has fallen to the lot of the author at various times to be the only doctor in a large interior district, which includes several military posts and ten mission stations, and having a population of nearly a million. He was frequently called upon to treat officers, both military and civil, and settlers, when no other medical help could have been procured. The Government here, more than elsewhere finds difficulty in securing sufficient medical officers even to meet the needs of Euro-

pean centers and is therefore seldom able to provide any for the native areas.

The hospital plant of the mission was quite meager, constituting a dispensary building containing a small laboratory and operating room, with temporary quarters for ward space adjoining. The work has had to be conducted without the assistance of a trained nurse. For this reason we were obliged to rely on African assistants who had had but limited training, but they proved both willing and very apt.

Owing to the limitation of the missionary staff, it was often necessary to take an active part in the general missionary activities, and in the absence of an instructor in manual training and agriculture it seemed advisable for the doctor to participate in this work. To this end he inaugurated a boys' boarding school and personally superintended instruction in the trades, including carpentry, brick and tile work, tailoring, shoe making and hand loom weaving, as well as overseeing farm work for practical training and demonstration. The medical missionary was thus closely related to all phases of the work of the mission. The participation in these matters on the part of the doctor resulted in a better appreciation of the importance of this phase of the mission work on the part of the students.

The dissemination of the knowledge of sanitation and hygiene by missions has proved of great benefit to the people, and they have been ready to cooperate with the Government in its health program. Real service has been rendered in alleviating conditions which tend to reduce the excessive mortality and in promoting the efficiency of labor. Much more might be accomplished through fuller cooperation, especially on the part of those interested in the commercial development. Unfortunately there is a tendency toward antagonism on the part of some commercial men. The obvious antagonism on the part of some commercial men and traders in this part of Africa owes its origin in part, to their connection, in the not too remote past, with the traffic in slaves and in cheap, intoxicating liquor, in both of which they have sometimes been hindered by the presence of missionaries.

In some parts of the tropics medical missions alone are in a position to know the needs and administer to them. They already have workers on the ground with a knowledge of the language and have the confidence of the people. There remains only to take every possible step to insure the best use of these factors. This situation involves opportunities to make important contributions to general knowledge through the study of local conditions and problems, the recording of results and making these available through publication. It must be admitted that these opportunities have not always been made full use of in the past.

There is much yet to be learned about the treatment of tropical diseases, and even of so well known a disease as malaria, not to

mention some of the less known diseases peculiar to the tropics. To make an effectual use of these opportunities requires more funds than are sometimes available. It would be well if special funds could be provided for this purpose.

Whenever possible plans should be made for full cooperation with the Government in carrying out its health program. In those regions where the Government does not provide medical officers for native areas, or provide for the training of assistants for the work of sanitation and hygiene, medical missions are under obligation to take necessary measures to furnish the needed relief for their own constituencies at least. Our mission is working in territory which comes under the category of places where the Government has as yet made no adequate provision for medical officers for native areas, or for the training of natives for this work. We are facing this problem and trying to find a solution. The medical staff has been too limited to allow provision for adequate hospital facilities, or for a satisfactory health program. Our chief reliance has been on African assistants who have had only limited training in the dispensary. Selected young men with a short apprenticeship in the dispensary work at the station have been stationed at villages where mission work had been established. They were given a routine treatment for the more ordinary diseases and were able to do a real service in meeting the need of the community. They did valuable work in first aid and teeth extraction and in referring needy cases to the doctor in charge at the station. This method of procedure has proved satisfactory to the people, as is indicated by the urgent requests that have come in for more dispensers of this type. Where dispensers were not available it was found helpful to give the out-station teachers some special instruction and to leave with them a few such remedies as might be required in urgent cases.

The plan for the future development of the medical work of the mission calls for a special course of training at the central institute, with a view to developing capable assistants to participate in the work of hygiene and sanitation. The aim is to develop this course to as high a degree of efficiency in training as is possible under existing circumstances. Here is a summary of points for special emphasis:

1. Cooperation with Governments and commercial concerns in health program.
2. Careful study of the field, the keeping of records.
3. Disseminate knowledge through the use of the mission schools and the use of literature.
4. Cooperation with other departments of missionary work to aid in maintaining proper balance in educational attitudes.
5. Train nationals for medical service and public health work.

If we are to face undaunted, the tremendous area of Africa with all its desperate problems, together with the paucity of the available resources for attacking them, we need the dynamic of faith in the

omnipotence of God, the feeling of assurance that we are cooperating in the carrying out of His eternal purpose as revealed by His Son, the Great Physician.

THE SMALL HOSPITAL TYPE OF SERVICE FOR MEDICAL MISSIONARIES

DR. E. W. SMALZRIED

The type of service required in the smaller Mission Hospital calls for the exercise of every available resource with which the doctor in charge may be endowed. Talents and capabilities long dormant are certain to be aroused as the eager young physician strives to match his skill against the myriad odds that confront him. No finer challenge can be found anywhere for the missionary who hopes to give fullest expression both to his Christian ideals and his scientific training. He is daily dealing with scores of lives and the problems of their preservation, amongst a strange people with strange ideas about anatomy. He must be a psychologist. There must be a winsomeness about him to help overcome the timidity of his new friends, which coupled with his delicate skill in the operating-room and his patient attendance upon the sick in the wards and clinics will yield a hundred-fold harvest for the Master.

Mission hospitals in China are invariably built of brick. Many of them are models. Their cleanliness, their atmosphere of quiet and order are a source of unending wonder to our Chinese friends of the interior. Often as a patient stands on the threshold of the hospital he asks if it is actually permissible to step upon such sparkling floors and to actually lie between such spotless sheets. So that an indelible imprint has already been made upon his heart, without having heard a word from the hospital evangelist about the gospel of a clean heart.

We have said that the doctor's every available resource will be taxed. He may be faced with the alluring prospect of planning a new hospital where even a slight knowledge of carpentry is invaluable. Also his ability as a buyer is put to the acid test. He may be called upon to handle scores of workmen. He must keep harmony amongst the staff-members. High officials will call to inspect his hospital and to witness his skill. Here a bit of finesse is needed in diplomacy. His powers of organization will have full play. Matters must run smoothly where so little expert assistance is available. He may be amazed at his lack of knowledge of the culinary art as he grapples with the problem of dietetics. Careless laundry work may lead to disaster and he must needs make his rounds to the laundry. Sewage must be disposed of satisfactorily. A plentiful water supply must be available. And what with the keeping of books, the purchase of quantities of drugs and other supplies, proper sterilization of surgical supplies, and the teaching in the training school for nurses, the am-

bitious doctor and nurse find a veritable paradise of hard work. His laboratory is a *sine qua non*. He cannot neglect this essential unit. He must maintain his hours for study both in his chosen field and in the language without which he cannot wholly succeed in the smaller hospital. And withal find time for play.

Opportunities were given us to study more or less intimately seven smaller type hospitals in China. In every case the missionary and his Chinese doctor and nursing staff saw no less than ten thousand clinic patients a year. In three instances as many as twenty thousand were seen, and with five hundred to six hundred in-patients. Where in all the world could a Christian physician be happier than in such a situation?

THE TYPES OF SERVICE FOR MISSIONARIES IN THE LARGE HOSPITAL

DR. LEROY F. HEIMBURGER

In the evolution of the medical missionary program the natural laws of every other progressive movement have been followed. The pioneer medical missionary is well named in that his great task is in overcoming fear, ignorance, prejudice, and superstition. But when this has been done and as his reputation, not only because of his healing powers but more because of his Christian personality, increases, the number of diseased and injured calling for his help multiplies until he realizes not only the need of a proper place in which to house those needing his constant and special care but also the necessity of a colleague to share the duties and responsibilities of his growing work. The colleague appears, a modern hospital building with the necessary equipment is acquired and the work of the small two-man hospital is in operation.

These worthy utilitarian and small hospital types, very necessary and important to the medical missionary work, do not fully portray the best that modern medical work can offer as an example of what Christ's teachings have evolved in medicine in the Occident. All of us feel that nothing is too good for our purpose and are desirous of not only giving the best of ourselves to the work we choose but want the best materially to offer for the relief of suffering and disease. Nothing is more typically Christian in Western civilization than the modern hospital and its work. The constant painstaking methods of modern medicine in seeking for better diagnostic and therapeutic methods, along with the advances made in preventive measures to insure health to individuals and communities serve as an undisputable argument for the altruism which makes the teachings of Jesus the staff of life for the individual, community, or nation.

This desire to give of our best has led to the planning and building in the large mission centers of institutions similar to those found in

America and England. Hospitals, manned by three or more Christian physicians, have come into existence. Such plants are not only expensive to build and equip but also to operate and staff. Unless a church at home decides to concentrate its medical work in such a plant rather than attempt to carry on pioneer or small hospital work, the large hospital should be operated as a Union institution. By this I mean several Mission Boards cooperate in placing staff, and financing the running expenses. The question of whether the amount of money involved is best spent in this type of service or better used in doing utilitarian or small hospital work, is often brought up on the mission field. There are arguments for all sides of this question, but in this paper I hope to show just what the large hospital offers to the mission field in a type of service which is as worthy of our thoughts and money as any other work and which cannot be undertaken by a small hospital.

By the large mission hospital we mean an institution of over fifty beds in which three or more Western trained Christian physicians and surgeons are laboring. These men or women are specialists and are experts in their special fields by virtue of special post-graduate work and through limiting their experience for several years to certain branches of medicine instead of trying to spread themselves over the vast field of modern medical knowledge. In consequence, this specially trained staff with modern up-to-date equipment and more time for study are not only able to render efficient service to those who come for treatment but because of their better training and the better diagnostic and therapeutic agencies at their disposal are in a position to advise or otherwise help their overworked and time-pressed pioneer and small hospital colleagues.

It has been my good fortune to have started in the small pioneer hospital, to have worked in the small hospital type with the assistance of another medical missionary and finally to have the opportunity of working in the large type of hospital, so I can speak with experience in all the fields of medical missionary work as commonly met with. The hospital in which I have most recently been working is as unique and as progressive as any found in any land. It is a Union hospital in which about twenty-five specialists from the U. S. A., England, Canada, and China are working together to form a Christian medical profession for China, to render service to the millions of sick and suffering of that great republic. The type of service, therefore, which is outlined here will be a short résumé of the work which the Shantung Christian University Hospital is doing or is planning to do.

The unique contribution such a hospital gives is its specialized services to the pioneer and small hospitals. Many cases, both native and foreign, present difficulties which are impossible for the lone physician or moderately equipped hospital to handle. These cases are referred to the large hospital for expert opinion in diagnosis or treatment, thereby assuring of patient and referring physician

the best that modern medicine affords. The economic value alone of having such an institution available on the field has been proven repeatedly in that our Mission Boards have been saved hundreds of dollars in travel expenses to the homeland by missionaries because severe operative or specialized therapeutic and diagnostic agencies are available on the field. More use should be made of these hospitals and better facilities given to them for just such work.

Another important contribution is in the training of suitable assistants, nurses, and technicians. A second-rate medical student should never be the product of a missionary institution. In all other forms of education the mission institutions of non-Christian lands are the leaders, so the medical school must not be an exception. The acme of medical education was reached when bedside teaching was inaugurated and students were encouraged to use their pre-clinical teaching in the wards of large hospitals under the supervision of eminent physicians. On the mission field the large hospital type holds the position of the Class A hospitals of this country in its work for medical students and internes. Very few of the mission hospitals in China fulfil the requirements for such a service, because of inadequate equipment or staff, but those which do are amply rewarded for their efforts. Nurses are being successfully trained in small mission hospitals, but the larger experience offered in the wards of the larger hospital, either in the undergraduate training school or in post-graduate work is taken advantage of by the small hospital. The more specialized service of the large hospital is incomparable for special instruction in such items as operating room technique, obstetrics, or similar branches of nursing.

The difficulties of training technicians is a common experience of every pioneer. Competent anesthetists, laboratory workers, X-ray operators, and also technicians in physiotherapy can be trained only in the large hospital where the undivided oversight of experts can be had. The ease with which numbers of Chinese graduates of middle school can be trained in technical lines has been remarked on numbers of times. One of the best Wassermann technicians I have ever seen work is a deaf Chinese ex-table boy who was trained in our bacteriological laboratory in Shantung.

A fourth type of service ought to be added to the educational program of the large hospital, namely hospital administration. As far as I know, this type of work is not offered by any mission hospital, but the need of it has been brought forcibly to our attention by the evacuation of the large number of hospital administrators in China last year. One of the first tasks of the new medical missionary is hospital administrative work. Unless he has been fortunate in his choice of his interne work he has received no instruction in this subject either in the medical school or hospital. So in his spare time he picks up methods of inventory, bookkeeping, ordering supplies, organization of out-patient work, and many other factors

in which he has shown little or no interest formerly. Not only must he learn but he must be in the position to train another to carry on this work during his absence or when he is busy with the professional side of his work. This work of training administrators should be undertaken by the large hospital, so that when the foreign administrator is away the work of superintending the hospital can be placed in the hands of a capable native administrator. Our recent experiences in China, where the majority of mission hospitals were of necessity placed in the hands of untrained men, brings to us the urgent need of such a course of instruction for our medical students.

Finally, a fifth form of educational activity offers itself to the large hospital, namely the preparation of the new medical recruit for his future work on the field. Unfortunately this side of the work is not stressed on the field. No matter how well equipped a man may be to diagnose and treat the diseases usually found in America he is faced with many problems and diseases on the foreign field which are nonexistent where modern medicine is practiced. A few months during the second year on the field, spent in the wards and laboratories of the large hospital, will be of inestimable value to the new recruit in familiarizing himself with the diseases he will come in contact with in the interior station.

In addition to these educational opportunities, the large mission hospital affords the opportunity for research work. There is no field richer in research problems than the foreign mission fields, but unfortunately the lack of time, equipment, and finances makes it almost impossible for the medical man to utilize this wealth of material for the advancement of medical knowledge. When we realize the many problems in medicine yet to be solved, for example the transmission of leprosy, the causes of sprue, smallpox, and many other diseases, types of disease with which we are in constant association on the foreign field, we cannot help but feel that the medical missionary is not doing his part in attempting to solve some of these problems. Commissions are being sent out by non-missionary agencies to countries and districts in which medical work has been carried on for decades by the churches, returning with reports of their excellent work in finding the methods of eradicating hookworm, curing leprosy, Kala-azar, etc. Surely the medical missionary, with his pioneering spirit and desire for adventure and service to mankind, should have his share in such work. Could not an appeal be made for funds for such work to be carried on in our missionary program and extra equipment and assistants given to those of our number interested in research work? The large mission hospital is the logical place for such work because of the larger staff, larger number of patients, and theoretically the more time available for special work.

A further service which the large mission hospital offers is in public health and preventive medicine. At present this type of

work on the foreign field is expressed in lectures, health shows, free vaccinations, better baby shows, etc. Because of the larger number of men on its staff this work can be divided up so that no one is overburdened. From personal experience I have found that such work repays itself a hundred fold not only professionally but financially. One of the easiest methods of attracting the philanthropic non-Christian's attention is by giving a practical exhibition of what Christianity stands for; this is usually done by the hospital offering free vaccinations, or in its social service work.

The evangelistic opportunities of the large mission are different from those of the pioneer or small hospital only in that more patients are reached. In the University hospital we treated an average of 1,800 in-patients a year. The average length of time in the hospital for each patient is 20 days, so the total length of evangelistic contact, allowing only one hour a day per interview, would amount to 36,000 hours of the closest kind of personal work per year.

There are many more opportunities for service which the large hospital offers but which are not taken up in this paper. Pay clinics for the rich, who suffer just as much as the poor from malpractice in non-Christian countries, prenatal and post-natal clinics, venereal disease clinics, are mentioned in passing. The foreign field offers many opportunities for service, and every form of medical work necessary to New York City is equally necessary on the foreign field. Appropriations to the work are usually insufficient, but with time and patience ideals can be realized, and the rewards are great.

In closing I will sum up briefly what appears to me to be the type of service which the large mission hospital offers:

1. It serves the small mission hospital in being a place where competent consultants can be had, reliable laboratory and specialized diagnostic procedures can be performed, and where competent nurses, technicians, and administrators can be trained.
2. It serves the missionary force on the field and the Board at home in being able to do the grade of work which formerly required a health furlough in a large number of instances, thereby reducing the expenses of the foreign mission enterprise.
3. It serves the community directly through its out-patient departments, hospital wards, branch dispensaries and specialized clinics. It is the logical agency for public health education, and the practice of preventive medicine.
4. Above all it is the only type of medical mission service which offers adequate clinical training to the medical students who are to be the future physicians and surgeons of the country in which we are interested. What is of greater value to the Cause we serve than to rear up Christian men and women to form the great medical profession of China, India, or Africa?

REPORT ON MEDICAL SCHOOLS

Replies to a Questionnaire sent to Medical Student Volunteers

PREPARED BY LESLIE B. MOSS

The following information regarding medical schools in the United States has been compiled as a result of a questionnaire sent to about 150 medical student volunteers in various parts of the United States. Seventy-four replies were received of which fifty-five were from men and nineteen from women representing thirty-eight different institutions in the following twenty states:

Massachusetts	Virginia	Minnesota
New York	Illinois	Nebraska
Georgia	Missouri	Tennessee
North Dakota	Pennsylvania	Texas
Iowa	Colorado	Vermont
Maryland	Kansas	Connecticut
California	Michigan	District of Columbia

It must be remembered that the figures are not compiled as a result of consulting institutional catalogues, but from individual students in the various institutions. The replies from the different students have been indicated under each school by the letters A, B, C, etc. It cannot be said that these replies prove or disprove any particular theory; they simply serve to give information and express the personal opinions of students who are studying in these various institutions. In one case the reply was clearly from a preparatory school and is not included in the group here listed.

In addition to the questions with regard to expenses, the students were asked to state what opportunities there might be to earn a part of their expenses and their replies are indicated in most cases. Most of them find it exceedingly difficult to carry on outside work under the pressure of class work, although in some instances it is absolutely necessary that they do it in order to support themselves. The amounts that it is possible to earn vary from approximately \$100 to \$600 a year.

The question was also asked as to whether there was in the faculty and management of the school a spirit which contributed to the maintenance of one's positive religious life. In most cases the report indicated complete neutrality upon this point. In a few cases there was antagonism reported and in a very few cases the students reported an atmosphere of helpfulness. The detailed reports of various schools are as follows:

BOSTON UNIVERSITY SCHOOL OF MEDICINE, BOSTON, MASS.

Annual tuition, \$325.	Good	Average	Poor
Room rent for school year:	\$280	\$240	\$160
Table board for school year:	400	320	280
Opportunity to earn part of expenses same as in any large American city.			
Fine school; very courteous, helpful faculty; high standards.			

COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK CITY

Annual tuition, \$520.	Good	Average	Poor	
Room rent for school year:	\$270	\$234	\$180	(A)
	450	300	250	(B)
	212		170	(C)
Table board for school year:	300	250	190	(A)
	350	300	250	(B)
	396		288	(C)

- (A) There are 25 scholarships from \$150 to \$500; also student loan fund. Usual outside work. Average earnings in summer \$150 to \$300 beyond maintenance. Tuition high, but compensated by excellency of faculty and opportunities. Students have high academic standing. No discrimination against girls by students or faculty.
- (B) Make rather complete financial arrangements before entering.
- (C) Intensity of work and time required prohibit outside work except in case of extraordinary people. Must work intensely day and night. Competition is "cut-throat". Living and expenses very high. Have bulk of money for year.

CORNELL UNIVERSITY MEDICAL COLLEGE, ITHACA, N. Y.

Annual tuition, \$500.	
Room rent for school year:	No accommodations at school—rented apartment with four others at \$276 each. (A)
	Good, \$450; average, \$300; poor, \$210. (C)
Table board for school year:	Getting own breakfast and dinner, lunch at restaurant, about \$200. (A)
	Both room and board at rooming house, from \$323 to \$456. (B)
	Good, \$360; average, \$270; poor \$210. (C)

- (A) A few chances to assist professors; keeping library and hospital jobs. School one of the best; hospital affiliations splendid. Attitude toward women students fine.
- (B) Does not know of opportunities for earning part of expenses. Professional training excellent. Fine opportunities in N. Y. C. for contacts with diseases common in foreign countries.
- (C) Outside work heartily discouraged by faculty. Student life wholesome; faculty and students are ladies and gentlemen. New medical center in next four years will make it best manned in country.

EMORY UNIVERSITY, GEORGIA

Annual tuition, \$300.	Good	Average	Poor
Room rent for school year:	\$130	\$90	\$75
Table board for school year:	315	270	225

First year work too difficult to permit outside labor. After first year, waiting on table, tending furnace, etc. Good course for practising physician, high standard. Methodist institution,—religious atmosphere better than in State schools.

GEORGE WASHINGTON UNIVERSITY, WASHINGTON, D. C.

Annual tuition, \$304.	
Room rent for school year:	From \$15 to \$40 a month depending upon single or double, location, etc.

Table board for school year: In boarding house \$30 a month up.

Through political pull some get positions as night elevator operators in the capitol, house and senate office buildings. No time as a rule to work on outside jobs. Believe opportunities for learning medicine unexcelled. Last year rating with American Medical Association was higher than any other school in the Association.

HARVARD MEDICAL SCHOOL, CAMBRIDGE, MASS.

Annual tuition, \$400.	Good	Average	Poor
Room rent for school year:	\$250	\$200	\$120
Table board for school year:	450	375	275

Wide opportunities in Boston for outside work, but would discourage taking time away from medical course. Believe man could do no better than come here.

IOWA STATE UNIVERSITY, IOWA CITY, IOWA

Annual tuition, \$186, resident; non-resident, \$350 (rebate of \$40 to soldier or sailor of late war).	Good	Average	Poor	
Room rent for school year:	\$130-140	\$90-110		(A)
	180	110-165	\$72	(B)
Table board for school year:	250	200	150	(A)
	306	216	180	(B)

(A) Many opportunities for outside work but do not do it unless forced to, especially first two years, as time is limited. Noted for personal interest in students. With completion of new \$5,000,000 hospital it will rank second to none in hospital and laboratory equipment.

(B) Usual board jobs and a few industrial and clerical. Believe it fully equals Northwestern first two years. Clinical years better in larger city. However, intensive study of few cases is made here.

JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, PA.

Annual tuition, \$400.	Good	Average	Poor
Room rent for school year:	\$175	\$130	\$90
Table board for school year:	350	260	225

City affords a variety of outside work but school discourages it.

Splendid faculty; opportunity for wide clinical experience; high standards and thorough training.

JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.

Annual tuition, \$400 (may be higher next year).

	Good	Average	Poor	
Room rent for school year:	\$160	\$135	\$100	(A)
	200	120	80	(B)
	160	120	100	(C)
Table board for school year:	315	270	250	(A)
	288-432	288	216	(B)
		250		(C)

(A) Outside work strongly discouraged, almost prohibited. However, he has easy watchman job at \$30 a month. School among best, but doubt if its excessive reputation is justified.

(B) Opportunities for outside work rather exceptional, but distributed through Registrar's office. Five or ten scholarships available, also loans to deserving parties. Even if additional effort to enter and meet expense necessary, would advise at least last two years in one of high ranking schools.

(C) No opportunity for outside work. If have lots of money come here. If not, go elsewhere.

MEDICAL COLLEGE OF VIRGINIA, RICHMOND, VA.

Annual tuition, \$250, resident; \$300, non-resident.

	Good	Average	Poor	
Room rent for school year:	\$130	\$95	\$70	(A)
	135 up	108-135	108 down	(B)
Table board for school year:	250	190	125	(A)
	360 up	225 up		(B)
	Average room and board, \$35 a month			(D)

- (A) In social centers, stores, etc. one can earn from \$100 to \$600 yearly. First two years as good as anywhere; for last two years more clinical material in larger city.
- (B) Receives \$30 a month as assistant in chemistry, but hardly time for it. Best school south of Baltimore, Md.
- (C) Opportunities for outside work fair—shops, laboratories, internships. Urge them to come—it's a fine school.
- (D) Few opportunities for outside work due to lack of time. Would learn as much here, but suggest school more widely known if can afford it.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, CHICAGO, ILL.

Annual tuition, \$300.

Room rent for school year:

(Lives at home)			(A)
Good	Average	Poor	
\$400	\$200 up	\$120 up	(B)
250 up	200 up	140	(C)
	200		(D)
250	210	200	(E)
240	200	120-160	(F)

Table board for school year:

(Lives at home)			(A)
Good	Average	Poor	
\$420	\$280	\$210	(B)
360 up	275-325	240	(C)
\$1-2 a day			(D)
1.50 a day	\$1.25	\$1.00	(E)
1.25-1.50 day	1.00	.85	(F)

- (A) Ample opportunity for earning. This school good as any of its scholastic standing.
- (B) Endless opportunity for earning part of expenses if a willing person. First have A.B. degree. Don't stop at minimum requirements. *Apply early.* Do not work outside during school for first and possibly second year.
- (C) Room and board jobs most abundant. May earn from \$300 to \$500 yearly. Freshmen should not spend much time on outside work.
- (D) Good opportunities for earning. Almost any kind, if time. Strongly recommend this school.
- (E) Fair opportunities for earning, but can't afford to spend too much time outside. By all means choose "A" school in large city where more clinical material.
- (F) Probably twenty earn tuition in school—others in varying degrees. Fine school.

RUSH MEDICAL SCHOOL, CHICAGO, ILL.

Annual tuition, \$300.

Room rent for school year:

Good	Average	Poor
\$270	\$180	\$150
350	270	200

Table board for school year:

About 80 per cent of students work outside, many earning all expenses. Easy to work for board.

SAINT LOUIS UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS, MO.

Annual tuition, \$325.

Room rent for school year:

Good	Average	Poor
\$160	\$135	\$100
250	225	180

Table board for school year:

Little time for outside work—results disastrous. Many do and have to repeat one or two years' work, which proves very expensive. If necessary, borrow money at any cost. An expensive school in a wicked city. Clinical material good and very practical course.

STANFORD MEDICAL, SAN FRANCISCO, CAL.

Annual tuition, \$300.	Good	Average	Poor	
Room rent for school year:	\$180	\$150	\$125	(A)
	180	135	90	(B)
Table board for school year:	315-360	270	225	(A)
	405	325	270	(B)

(A) Can earn \$50 a month. Excellent school. Open mindedness makes for progress and truth.

(B) Opportunities for outside work poor first year; good for last three. Come if can make the grade. No more expensive than other schools of same class.

TEMPLE UNIVERSITY, PHILADELPHIA, PA.

Annual tuition, \$280 (\$350 after September 1928).	Good	Average	Poor	
Room rent for school year:	\$180	\$150		
Table board for school year:	275	225	\$180	

Very few opportunities for earning outside.

VANDERBILT MEDICAL SCHOOL, NASHVILLE, TENN.

Annual tuition, \$300.				
Room rent for school year: Good, \$120 up for single; \$80-100 for double.				
Table board for school year: Good, \$270-300; average, \$225; poor, \$180.				

Very good chance to secure outside work. Relations between faculty and students very fine (except religion). Individual attention. Better equipment than almost any other school in United States and as good as any. Only 50 in class.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS, MO.

Annual tuition, \$325.				
Room rent for school year: \$135-180 at dormitory.				(A)
	Good	Average	Poor	
	\$130	\$110	\$100	(B)
	240	160	120	(C)
	240, single; 160, double; dormitory, \$130			(D)
Table board for school year: Average, \$270-360.				(A)
	Good	Average	Poor	
	\$360	\$270	\$200	(B)
	280	240	200	(C)
	500	350		(D)

(A) Opportunities for outside work less than in many schools. First year student should not attempt it. School not excelled this side of Atlantic. Only one school where would just as soon be, namely Harvard.

(B) Good chance for outside work. High standard of scholarship, fine faculty.

(C) Good chance if one really wants outside work. Environment not best. Christian spirit, although perhaps as good as any. Would advise to come.

(D) Numerous opportunities to earn part of expense, but do not try during first two years. All right later, and good pay. Have seen most of the large schools and would strongly urge looking into this one.

WOMEN'S MEDICAL COLLEGE OF PENNSYLVANIA, PHILADELPHIA, PA.

Annual tuition, \$300.	Good	Average	Poor	
Room rent for school year:	\$216	\$180	\$108	(A)
	160	140		(B)
	175-200	140		(C)
	130-160	112		(D)
	150	140		(E)
	216-324	180	108-144	(F)

- Table board for school year: Average, \$1.25 a day; poor, \$1. (A)
 Good, \$308; average, \$308. (B)
 Apartment life, good, \$175; boarding, \$280 (C)
 Good, \$225; average, \$200; poor, \$120. (D)
 Average, \$252; poor, \$216. (E)
 Good, \$360-432; average, \$252-288. (F)
- (A) Very few outside opportunities for work. Gynecology and obstetrics best in country. Other departments compare favorably with other schools.
- (B) Small opportunity for earning expenses. First two years of course fair. Clinical work of last two better than almost any grade "A" school around here, in several lines besides obstetrics.
- (C) Some opportunity for earning. Few scholarships. Expense moderate, training good, equipment and facilities will be greatly increased when new college complete.
- (D) Can earn most by preparing or buying some of own food, thus saving on cost of living. Don't work outside. Excellent foundation course first two years. Splendid atmosphere in student body.
- (E) Very little opportunity for earning part of expenses. First two years of course very thorough.
- (F) Only table waiting—no other—nor is there time for it. If one has been to woman's college, I think University work has certain advantages; other wise I highly recommend Woman's Medical for good training.

YALE UNIVERSITY SCHOOL OF MEDICINE, NEW HAVEN, CONN.

Annual tuition, \$500.

Room rent for school year: Good, \$238; average, \$170; poor, \$150. (A)
 \$110-200 in private home. (B)

Table board for school year: Good, \$500; average, \$300; poor, \$250.
 (So high and unsatisfactory that many live in apartment and get own meals at cost of \$200 rent, plus \$200 for living.) (A)
 Good, \$250. Yale Commons, \$205, exceedingly good. (B)

- (A) May earn nearly all expense if a man. Scholastically offers unique advantages. Fine for person capable of standing on his own feet, sure of religious faith.
- (B) If one has to can get job—University has a bureau for this purpose. Exams and all work up to third year are voluntary. If you pass you can go on. Doubt if you can beat this school.

UNIVERSITY OF BUFFALO, BUFFALO, N. Y.

Annual tuition, \$400

	Good	Average	Poor
Room rent for school year:	\$160-200	\$140-160	\$100-140
Table board for school year:	280-360	240-280	200-240

Many opportunities to earn a part of expenses but don't advise in first year. Come to Buffalo, but if to be a medical missionary take prep work in school encouraging students. Steer clear of medical fraternities, as strongly antagonistic here to any form of religion.

UNIVERSITY OF CHICAGO, CHICAGO, ILL.

Annual tuition, \$300.

	Good	Average	Poor
Room rent for school year:	\$250	\$150	
Table board for school year:	400	270-340	\$250

Good chance for earning part of expenses. Quite a few cover their expenses, but it requires full limit of ability. The quarter system is a decided advantage, as it is possible to discontinue for short periods. Standards very high.

UNIVERSITY OF COLORADO, DENVER, COLO.

Annual tuition, \$168, resident; \$273, non-resident.

	Good	Average	Poor	
Room rent for school year:	\$200	\$150	\$100	(A)
	150	100	60	(B)
	90 double	65	40	(B)
Table board for school year:	360	300	250	(A)
	360	270	180	(B)

(A) Good opportunity for earning, but not advisable to attempt in first year. Denver fine place. Expenses rather high, course rather hard. Ranks "A".

(B) Some opportunities for earning but few are able to attend school and work. There is no better school for first two years. Is improving in clinical opportunities.

UNIVERSITY OF GEORGIA, AUGUSTA, GA.

Annual tuition: Resident, \$105 first year; \$100 yearly thereafter.

Non-resident, 300.

Room rent for school year: \$180 for good single room; \$90, double.

Table board for school year: Good, \$360; average, \$270.

Very few opportunities for earning money.

UNIVERSITY OF ILLINOIS, CHAMPAIGN, ILL.

Annual tuition: Resident, \$130, 1st and 2d years; \$160, 3rd, and \$165, 4th.

Non-resident 165 " " " 195 " " 200 "

Lives at Chicago Lutheran Bible School; cost for room, \$200 for 8 months.

Cost of table board, 225 " 8 "

Most students earn board and room. Tuition is lower than other schools. Chicago offers many opportunities in medical field not found elsewhere.

UNIVERSITY OF KANSAS, LAWRENCE, KANS.

Annual tuition: Resident, \$77; non-resident, \$92 for first semester.

" 150; " " 200 for last two years (incomplete).

Room rent for school year: \$180 for good single room; \$112-135 for double. (A)

	Good	Average	Poor	
Table board for school year:	\$160	\$100-120	\$80	(B)
	252	200-216		(A)
	400	280	220	(B)

(A) Some opportunity for outside work but think no time. Honestly recommend this school, but urge taking pre-medical here also and not at small college.

(B) Stenographic and restaurant work available. If time can be spared can earn \$100 to \$200 a year. No. 1 school, with expense quite below average. Last 1½ year in Rosedale, suburb of Kansas City.

UNIVERSITY OF MARYLAND, BALTIMORE, MD.

Annual tuition, \$350.

Room rent for school year: Good Average Poor

Table board for school year: \$180 \$145 \$90

300 240 180

No opportunities whatever for earning part of expenses.

UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

Annual tuition: Resident men, \$188; women, \$179.

Non-resident men, \$268; " \$259.

	Good	Average	Poor	
Room rent for school year:	\$200 for double	\$140-160	80-120	(A)
	280-320 single	200-240	160	(A)
	\$160 a semester in dormitory.			(B)
	Good Average Poor			
	\$200 \$160 \$100-120			(C)

UNIVERSITY OF TENNESSEE, NASHVILLE, TENN.

Annual tuition: Resident, 1st, 2d and 3d years, \$125; 4th year, \$150.
Non-resident, " " and " " 225; " " 250.

	Good	Average	Poor	
Cost of room and board for school year:	\$350	\$300	\$275	(A)
	320	240	160	(B)

(A) Very few opportunities for outside work. However, we are usually favored by hospital coöperation. Faculty has increasing interest in students. School will soon be one of America's greatest.

(B) Opportunities for earning outside fair. Good school for learning thoroughly fundamentals of medicine.

UNIVERSITY OF TEXAS, GALVESTON, TEXAS

Annual tuition: Resident, 1st and 2d years, \$78; 3d, \$66; 4th, \$78.

Non-resident, plus \$150 a year. (No actual tuition—all above is fees.)

	Good	Average		
Room rent for school year:	\$96	\$48	less at "Y."	(A)
		65-80		(B)

	95	75	Poor	
	80-120		\$50	(C)

Table board for school year:	240	200		(D)
		200		(A)
	240	200	160	(B)

(much less if three or four live together) (C)
\$200-240 in fraternity or about \$240 outside (D)

(A) Outside work not advisable in most cases.

(B) Very few opportunities for earning expenses—not advisable.

(C) Not advisable to work outside because of pressure of course. Have influenced many to come here. For Texans cheap—first year, \$480 for everything. Prepares for all-round doctor.

(D) School cost low—not many work. Good course, is cheap, and in a fine town.

UNIVERSITY OF VERMONT, BURLINGTON, VT.

Annual tuition: Resident, \$275. Probably \$375 for non-resident.

Room rent for school year: Good, \$144; average, \$108; poor, \$72.

Table board for school year: " \$324; " \$252; " \$180.

Many opportunities for earning. Small school but advantages. Good for women. Finishing touches can be secured in United States clinics and abroad. Total enrollment 130.

UNIVERSITY OF VIRGINIA, RICHMOND, VA.

Annual tuition, \$160, non-resident.

Room rent for school year: Average, \$135.

Table board for school year: " 270.

Fairly good opportunities for outside work if time to spare. Excellent course but no strong religious atmosphere. One's manhood should be developed before coming here.

AMEBIC LIVER ABSCESS*

A. I. LUDLOW, M.D.

SUMMARY

1. All the 160 patients recorded in this report are Koreans.
2. Although Chosen (Korea) has a temperate climate, both amebic dysentery and amebic liver abscess are common among the Koreans.
3. While amebic dysentery is common among the white population in Chosen, no case of amebic liver abscess has been reported.
4. Amebic liver abscess is infrequent before the age of 20 and after the age of 50 years. Seventy-four per cent of the patients were between the ages of 21 and 40 years.
5. The incidence of amebic liver abscess in Korean females is 11.2 per cent; a much larger percentage than that reported in other countries.
6. Our records seem to warrant more stress on the use of alcohol as a pre-disposing cause of amebic liver abscess.
7. A history of previous diarrhea or dysentery was obtained in 90 per cent of the patients, but it is a significant fact that amebic liver abscess may occur in patients who have never had a diarrhea or symptoms indicating infection with *E. Dysenteriae*. It is also of interest to note that in three cases of liver abscess *E. Councilmanii* was the only ameba found in the feces.
We wish to suggest the possibility of *E. Councilmanii* as a cause of liver abscess.
This may be proved when it is possible to differentiate *E. Dysenteriae* from *E. Councilmanii* in their motile forms or when it is possible to encyst the motile form perhaps in culture from liver pus.†
8. The abscess developed, as a rule, insidiously. Large abscesses were present with nearly normal pulse, temperature, respirations and blood count. The average respiration rate is 25.
9. In our additional series (60 cases) the duration of illness ranged from 2 weeks to 40 weeks, with an average of 13.5 weeks.
10. The large single abscess of the right lobe of the liver predominated. The average amount of pus obtained in the last 60 patients was 1,109 c.c.
11. Deep-seated pain in the region of the abscess elicited by a sudden thrust with the end of the finger is an important and practically constant sign.
12. The "follow-up" mortality of 117 open operations was 11.1 per cent, and of 43 aspirations 2.3 per cent, or a total of 8.75 per cent.
13. The early and energetic treatment of amebic dysentery with emetine and other medication is an efficient prophylactic for

* This paper was based on the article appearing in the *China Medical Journal*, December, 1926.† *E. Councilmanii* is now considered to be a variant of *E. Dysenteriae*.

amebic liver abscess. We have seen no case develop in Koreans or foreigners thus treated.

14. Ricci and others have proved that small amebic liver abscesses can be cured by medicinal means. It would seem advisable, however, even in such cases, to hasten recovery by aspiration.

15. Aspiration is the method of choice.

16. Open operation, in our experience, is not attended with great mortality and we purpose to continue it in selected cases.

17. Keep a mental attitude of suspicion as to the possibility of amebic liver abscess in localities where amebic dysentery is prevalent and even in places where it is not so common.

RECTAL ETHER ANALGESIA IN LABOR

Technic and Results in 5,800 Cases at the New York Lying-In Hospital*

JAMES A. HARRAR, M.D., F.A.C.S.,

Attending Surgeon

For the past three years at the New York Lying-In Hospital we have been studying and extending the use of the Gwathmey method of rectal ether analgesia in labor. At the present time we are employing it in more than two hundred confinements each month and up to date have used it in 5,800 cases with very satisfactory results. By this we do not claim painless childbirth, but it gives relief to the agonizing part of the ordeal of labor.

The drugs required are morphine sulphate, magnesium sulphate, quinine and ether. One dose of a quarter of a gram of morphine is used hypodermically with 2 c.c. of 50 per cent solution of magnesium sulphate to prolong the action of the morphine. Half of the quantity of ether required for rectal anesthesia is dissolved in oil with 20 grains of quinine alkaloid, and a four-ounce mixture is instilled into the rectum as a retention enema at an interval following the morphine and magnesium sulphate injection. The ether is slowly and regularly absorbed over a period of several hours. The result in 85 per cent of cases was great relief of pain, and more or less relief in 10 per cent more.

Following the technic about to be described, we have seen no ill results to the mother, and the usual disadvantages of other methods of easing pain in childbirth—perineal delay and asphyxia of the newborn child—are not in evidence. In comparison with the Freiburg “Dammerschlaf,” experience with which in 100 cases McPherson and I reported to this Society in 1914, we found the effect produced upon the mother’s suffering very similar in typical cases; but with no

* Reprinted from the Bulletin of the Lying-In-Hospital of the City of New York, July, 1927, by permission of the author.

inhibition of good bearing-down efforts in the second stage, and with no alarms regarding the respiratory condition of the child at birth. It was for these two reasons that we gradually abandoned the typical twilight sleep. Rectal analgesia especially takes the place of intermittent nitrous oxide gas anesthesia during the last few hours of labor. Being simple it can be used in the home without the service of a skilled anesthetist.

We will admit that many labors, especially in multiparae are easy and brief, and there is scarcely need, nor time, for the use of any analgetic, but in a majority of labors the suffering of the mother demands relief. With only 4 per cent of negative results and no serious effects on the mother or child we recommend this method for a more extensive use in hospital and home confinements. The details of the standard technic which, though we may adjust it to the individual patient, we have not materially changed in the past two years, are as follows: (I shall quote from my paper read before the Philadelphia County Medical Society, March 11, 1925.)

The treatment should not be started until the woman is in active labor. The pains should be at least at five-minute intervals and lasting at least forty seconds. The length of the contractions are best judged by placing the hand on the abdomen and timing them with the watch, as the outcry of the woman is often a poor index of the strength of the pain. Waiting for the labor to be well-established thus at once eliminates cases of so-called primary inertia from treatment. In a primipara it is best to wait until the cervix is fairly well effaced and dilated to a diameter of at least two finger tips; in a multipara it can be started before this degree of cervical dilation is reached, if the pains are of the proper length and interval as described. At this time a cleansing soapsuds enema is given, and this is followed by the primary, intramuscular injection of $\frac{1}{6}$ or $\frac{1}{4}$ grain of morphine and 2 c.c. of 50 per cent solution of magnesium sulphate deep into the gluteal region. Judgment must be used as to the soapsuds enema, as it may not be required, if the customary soapsuds enema at the onset of labor has been recently given. The rectum must be both empty and quiescent to retain properly the instillation of ether in oil that is to follow the primary morphine and magnesium sulphate intramuscular injection. Experience has shown that $\frac{1}{4}$ grain of morphine is usually the proper dose, but in a small woman $\frac{1}{6}$ grain will be sufficient. Labor should be well under way as previously stated, so that the morphine will not stop the uterine contractions altogether. Tell the patient the object is to relieve her pain, but do not promise her a painless labor.

After this primary intramuscular injection of morphine and magnesium sulphate the patient is to be kept quiet, oiled cotton is placed in the auditory canal, and the room is darkened. These attentions are reminiscent of the scopolamin amnesia suggestions, but they are of undoubted value in the proper induction of any semi-narcosis. Twenty minutes after the primary morphine and magnesium sulphate injection we give a second intramuscular injection consisting of 2 c.c. of 50 per cent solution of magnesium sulphate alone. This is given no matter whether the effect of the primary injection is sedative or not, as it tends to prolong the action of the morphine.

We now come to the manner of giving and the time of the rectal instillation. It must not be used too soon. If the effect of the morphine and magnesium sulphate is sedative, withhold the instillation until the effect of the former is almost worn off. It is easier to give when the patient is still somewhat under the effect of the morphine; however, three to five minute intervals between uterine contractions should be present. For the beginner it is better to let the morphine and magnesium sulphate wear off entirely and to withhold the instillation until the patient is again complaining and the pains, at three to five minute intervals, are good and strong.

If there is no relief from the morphine and magnesium sulphate within one-half hour after the second injection, which consisted of 2 c.c. of 50 per cent magnesium sulphate alone, proceed with the ether instillation. The ether instillation thus rarely should be given within an hour after the first injection of morphine and magnesium sulphate. It may be from one to three hours before it is needed, depending on the patient's distress. The ideal time in a primipara is at about three fingers tips' dilation of the cervix.

The retention enema which can readily be prepared by any druggist, consists of

Quinine alkaloid	grains xx
Alcohol	minims xl
Ether	ounces iiss
Olive oil	q. s. ad. ounces iv

It is given as follows: The contents of the bottle containing the ether mixture and the bottle containing two ounces of plain olive oil are warmed by letting them stand for a few minutes in warm water, first loosening or removing the corks. The patient is then placed on her left side and vaseline is liberally applied around the anus so that the ether mixture if expelled will not irritate. State to the patient, just before beginning the instillation, that its object is to relieve her pain, and thus secure her coöperation. Tell her that during the instillation she is not to press down during pains, but to breathe deeply with her mouth open, and at all times to "draw up" with her sphincter as if she were trying to avoid expelling gas. This will tend to induce reverse peristalsis and permit the fluid to run in more readily.

The apparatus consists of a four ounce funnel attached to a twenty inch length of rubber tubing, which is in turn connected by a glass connecting tip to a red rubber catheter, size 20 or 22 French. A rectal tube is too large.

Pour into the funnel one ounce of warm, plain olive oil. Just as the oil runs out of the catheter pinch the latter near the glass connecting tip with an artery clamp. In this way all the air will be expelled from the tubing. Some of the one ounce of oil should still remain in the funnel. The catheter is now introduced into the rectum for about four inches. If the fetal head is well down in the pelvis, the gloved finger must be inserted into the rectum along with the catheter to insure its passage past the head. A little of the warm ether mixture is added to the oil in the funnel, the clamp released and the contents of the funnel slowly permitted to run into the rectum. The remainder of the ether mixture is gradually added, at no time permitting the funnel to become entirely empty. Just as the last of the ether mixture is about to leave the funnel add the remaining ounce of the warm plain olive oil. Allow this to start running into the rectum and clamp the tube. It is important in order to avoid the expulsive desire that we prevent the entrance of any air bubbles into the rectum. Now make pressure on the anus with a towel during two or three contractions, leaving the pinched catheter in place meanwhile, then gently withdraw the catheter. Should a uterine contraction intervene during the instillation simply make pressure against the anus with a folded towel and let the funnel act as the escape reservoir. Continue to make pressure over the anus during three or four contractions after the catheter is removed. All these details are important and the successful retention of the instillation largely depends on the meticulous care with which it is given.

A third intramuscular injection of 2 c.c. of a 50 per cent solution of magnesium sulphate alone is then given immediately to prolong the action of the ether. The patient may now turn upon her back or assume whatever position is most agreeable to her. The same quiet is maintained as before. Do not make a vaginal or rectal examination too soon after the instillation or the instillation will be expelled. Do not be misled by the quiet behavior of the patient into thinking she is having very slight contractions or none at all. Within fifteen or twenty minutes you can smell ether on her breath, she becomes flushed, and occasionally has a little of the excitability of the first stage of ether anesthesia, but rarely to the extent of requiring restraint.

The patient is drowsy and sleeps lightly between the pains, but consciousness is not entirely lost. She responds somewhat tardily to questions and usually obeys

commands as to change in posture. When a uterine contraction occurs she manifests her suffering to a greater or lesser degree and again dozes. Occasionally the casual observer would have the impression that there was very little amelioration of the pain, the patient complaining and restless during the contractions, and yet afterward we find the amnesia secured to have been as definite as that after scopolamine. Frequently the patient confesses of her own volition that she remembered very little after the rectal instillation was given.

The obstetric side of the case and the progress of labor must be closely watched. Functional abnormalities must be discovered and corrected as they arise, and the mechanism of labor followed and managed as thoroughly as though no analgesia were being employed.

When the effect of the first ether instillation has worn off; that is, when the patient again complains of pain, which is usually in from two to three hours, a second, or even a third, rectal instillation may be given at intervals of three hours or more. The first instillation given contains 20 grains of quinine alkaloid; in subsequent instillations only 10 grains are used. Each subsequent instillation is accompanied with one intramuscular injection of 2 c.c. of a 50 per cent magnesium sulphate solution. Contrary to some authorities we are convinced that the quinine is absorbed by the rectum, as evidenced by the occasional complaint of buzzing and ringing in the ears or slight deafness after the labor. We tried 30 cases, omitting the quinine entirely and found the omission of the quinine caused definite second stage and perineal delay. Dr. Losee, of the hospital laboratory, has now definitely proved the rectal absorption of quinine by its qualitative recovery from the urine in 92 out of 100 parturients.

A minimum of inhalation ether is needed for the delivery, and the anesthetist must be cautioned about this. Frequently no additional anesthesia is needed even for a perineorrhaphy. Chloroform should never be used with the ether rectal instillation. Gas, if desired, is safe and very satisfactory as an adjuvant anesthetic for the delivery.

Relief of pain in labor is always open to two serious objections: the prolonging of the labor and the endangering of the safety of the mother or her baby. We believe this method, of all procedures we have so far studied to be the least likely to prolong the labor if not used too early, and in over 5,800 trials in the past three years to have been without danger to either mother or child. It can be used both in normal labors and in cases of dystocia, in labors induced with bags, in toxemias, in cardiaes, and in women in labor with acute pulmonary conditions to whom inhalation anesthesia might be disastrous. We find that it is applicable in hospital practice in 70 per cent of all labors. This is twice the applicability of scopolamine amnesia in our hospital experience twelve years ago. In other words, there is no obstetric contraindication to the treatment after active labor is initiated. It can be used in the home with equal facility and with equally good results, and does not require the services of a trained anesthetist, especially taking the place of gas anesthesia in the last three hours of labor. The out-patient staff at the hospital are using it with good effect in the tenement confinements. It perhaps does not carry the patient along as thoroughly as or continuously as morphine-scopolamine amnesia, but it gives more relief than any form of inhalation analgesia with which I have had experience. It is not dangerous to the baby, though if pushed to the degree of complete anesthesia, which is not the desired object of the treatment, the baby may be born rather deeply anesthetized. We

find no increase in operative deliveries; in fact in some comparative series it seemed proved that the use of forceps was decreased. There has been no increase of postpartum hemorrhage and no increase in the stillbirth rate.

There are certain occasional annoyances—I cannot call them disadvantages—of the method to which I must refer. Most of them are due to faulty technic. The most evident of these is occasional expulsion of the rectal instillation. Close attention to all the details of giving the retention enema will obviate its loss in bulk. The frequent extrusion of small quantities of light yellow, sour smelling, liquid fecal matter, making it more difficult to keep the field clean in the perineal stage, will not occur if the cleansing soapsuds enema is completely expelled before giving the rectal instillation. In some cases nausea is present, but not as commonly as after inhalation etherization. Patients at times will complain of a slight burning sensation in the anal region immediately after the rectal instillation. The liberal use of vaseline will prevent this, though it sometimes may be due to an unrecognized fissure. Now and then there is some distention of the colon with gas but not to any serious degree. Rarely the patient has diarrhea during the first twenty-four hours postpartum.

There is never any tender induration after the magnesium sulphate injections such as we see after mercurial injections. To date there have been five abscesses. Two of them occurred when we were using 6 c.c. in bulk of magnesium sulphate solution at one time, and two occurred after giving the injection in the thigh over the fascia lata, a location especially susceptible to abscess after any hypodermic. Considering the thousands of injections we have given, we are satisfied that, given intramuscularly with aseptic technic, the magnesium sulphate solution will not cause any abscess or necrosis per se.

If the primary injection of the morphine and magnesium sulphate is given too early it may temporarily stop the labor, but we have all seen morphine alone do the same thing when we have given it to ease the parturient's suffering while the cervix dilated. If this does occur, when the labor starts again the whole cycle of analgesia is repeated, waiting until the pains recur at at least five-minute intervals and lasting over forty seconds, and the cervix is at least two finger tips dilated before beginning again with the morphine and magnesium sulphate injection. Remember also to be very light with the inhalation ether at the perineal stage, as the patient goes under readily with a minimum amount and the baby may be born deeply anesthetized if much inhalation ether is given the analgetized mother.

Variations in the scheme will occur to physicians who use the rectal analgesia as their experience with it widens. With very large women, or when the ether instillation has no effect or even excites the patient and the birth is anticipated within two hours, a second instillation of one-half the original amount may be given at once. At times in nervous primiparae, or where for some reason we would

like to start the analgesia before the pains and the cervical dilation had attained the desired stage, $\frac{1}{8}$ grain of morphine can be given with the first 2 c.c. of magnesium sulphate solution, and in one-half hour a second $\frac{1}{8}$ grain of morphine with the second 2 c.c. of magnesium sulphate, then waiting for the strong pains and three finger tips dilation of the cervix before giving the ether instillation by rectum.

When one has occasion to perform a cesarean section under local anesthesia, an ideal preliminary procedure is to reverse the sequence, giving the rectal-ether instillation an hour before the operation and the hypodermic dose of morphine twenty minutes before. This will place the patient in perfect condition to receive the local novocaine injections, and the analgesia is greatly augmented. Recently we have followed this technic in several cesarean sections under local anesthesia and the absence of suffering on the part of the patient has been noteworthy.

In order to suitably classify our results in the histories we designate as an *A* case, one with perfect analgesia, i.e., where there was almost complete relief of pain and no additional inhalation anesthetic was needed for the delivery; as a *B* case, one where additional inhalation anesthetic was needed for the delivery; as a *C* case, where there was only slight relief of pain; and as a *D* case where there was no relief of pain. With this classification as a criterion the accompanying chart was made out. Fig. 4 lists 5,784 analgetized labors occurring in 1924, 1925, and the first six months of 1926. *A* and *B* cases were combined to produce a curve averaging 85 per cent, *C* cases averaged 10 per cent, and *D* cases averaged 4 per cent.

SUMMARY

Pain is greatly relieved in 85 per cent of cases. In 5,800 analgetized labors we have observed no increase in asphyxia at birth or in the stillbirth rate. There is no prolongation of the perineal stage or increase in forceps delivery. The only contraindication to the procedure is uterine inertia and the only restriction is not to start too soon. The woman should be in active labor; that is, pains every four to five minutes, lasting forty seconds by the watch, and in a primipara, preferably the cervix should have attained a dilation of two or more finger tips. The mechanism of labor must be as closely followed by the obstetrician as if no analgesia were being employed.

The drugs required—morphine, magnesium sulphate, ether, and quinine—are easily obtained and well known in their action. The quinine is found to be an essential ingredient in the rectal instillation formula. The applicability of the method is much greater than that of scopolamine amnesia. It can be used safely and effectively by the physician in home confinements and does not require the services of a trained anesthetist. We are assured that this is the safest and most effective manner of relief of the pain of childbirth over a period

of hours that has yet been devised, and are convinced that it will abolish the most dreadful part of the ordeal of labor without danger to either the mother or her baby.

PROBLEMS OF LICENSURE IN VARIOUS COUNTRIES FROM VIEWPOINT OF MEDICAL MISSIONS

DR. MARK H. WARD

HERE in the United States in all our states the law requires that any one practising medicine must secure a license from the state government.

1. All of the states require the passing of an examination. Out of the 48 states, 36 recognize a certificate from the National Board of Medical Examiners in place of the state examination, and 33 states through reciprocity recognize the certificates of at least 24 states. These examinations now cover the work of a full medical course, and usually are both written and oral, and in the English language.

2. All states require a candidate to have a diploma from a recognized medical school. Thirty-nine out of the 48 require two years of college before medical school. Twelve states require also a year's internship after graduation.

3. Citizenship requirement:

11 states require full citizenship papers.

11 states require first naturalization papers.

6 states require declaration of intention.

28 states exclude doctors who are citizens of other countries from practising medicine.

PHILIPPINE ISLANDS

Registration at capital of province necessary.

Examination by Medical Board of Examiners at Manila.

Diploma from medical school with two years' college work.

Examinations cover full medical course in English or Spanish.

PORTO RICO

Must be citizen of U. S. A.

Must have diploma of medical school.

Must pass full examination in Spanish or English or have certificate from National Board of Examiners.

CANADA

Licensed by Medical Council of Canada or by boards of various provinces.

Diploma and license from U. S. A.

Examination written, oral and practical.

MEXICO

Licensed by Health Department of National Government.

Registered by Secretary of State of province.

Any diploma recognized by National University of Mexico.

Also examination may be required.

SOUTH AMERICA IN GENERAL

License only after thorough examination either in Spanish or Portuguese.

ARGENTINE

License by government.

Diplomas from medical school.

Full set of examinations in Spanish spread through a period of two years.

BRAZIL

Diploma from federal medical school.

Diploma and license in U. S. A. duly certified.

Full examination at federal medical school.

All branches of medical course.

Oral and practical.

In Portuguese language.

PERU

License by Faculty of Medicine of University of San Marcos.

Diploma and license from U. S. A.

Four years of college.

Examination covering full medical course, written, oral and practical, in Spanish.

BOLIVIA, CHILE, COLOMBIA, PARAGUAY, VENEZUELA

License by government.

Diploma from medical school.

Full set of examinations in Spanish language.

GREAT BRITAIN

License by profession recognized by government.

Final examination of English Conjoint Board, London, or Scottish Conjoint Board, Edinburgh, in English language.

Reciprocity between United Kingdoms, and practically all its dominions and colonies, and with Italy and Japan.

UNION OF SOUTH AFRICA

Natal, Rhodesia, Transvaal

License by government.

Require registration in Great Britain.

Diploma and license in U. S. A.

Examination by Conjoint Boards, London or Edinburgh.

PORTUGUESE EAST AFRICA

WEST AFRICA (Angola)

License from Portuguese Government.

Portuguese diploma in medicine and surgery.

Regular examination for whole course in Lisbon in Portuguese language.

It is possible to practise medicine among the natives without a license if there is no competition with Portuguese doctors.

CAMEROON WEST AFRICA (French Mandate)

License from French Government or diploma French College of Medicine.

As a temporary measure the governor recognizes American diploma and license.

TURKEY

Registration.

Regulations do not apply to foreigners who were established in practice in Turkey on January 1, 1923.

With diploma and license from U. S. A.
Thus enter last year in Medical School, University of Constantinople.
Examinations to graduate from University of Constantinople.
In Turkish language.
(New foreign doctors discouraged.)

PERSIA

A law recently adopted necessitates registration by the Persian Government.
Former practitioners were registered on evidence of practice.
Those with European or American medical diplomas accepted without examination.
Others must take examination in French or Persian.

SYRIA (French Mandate)

Registration with government.
Diploma } presented to Department of Hygiene and Public Health.
U. S. A. license }
Given a provisional license.
May require examination.
All subjects, practical, theoretical, oral and written, in French or with English interpreter.

GREECE

License from Greek Government.
Diploma from medical school.
Examination by Medical School of National University of Athens.
Full examination in Greek, possibly in French or German.

BULGARIA

Must be Bulgarian subject.
License from University of Interior.
Diploma from state gymnasium.
Diploma from medical school and a final examination only in Bulgarian language.

EGYPT

License from Public Health Department.
Diplomas.
Resident of Egypt.
No examination.

INDIA—*Marathi*

Licensed by government.
Governor may permit registration of any who were practising medicine before June 25, 1912.
Diploma from medical schools of Great Britain.
Diploma from medical schools of U. S. A. (Columbia, University of Penn., Stanford University).
(No examination required as yet.)

CEYLON

License.
Diploma and license granted in Great Britain.

SIAM

Only in Bangkok license from government.
In provinces no restrictions.
Diploma from Class A school, U. S. A.
(No examination.)

NETHERLANDS, EAST INDIA AND JAVA

Must be licensed by Dutch Colonial Government of East Indies.

Presentation of diploma and U. S. A. license.

Oral examination in surgery, medicine, pharmacology, obstetrics, skin diseases, and eye, ear, nose and throat. May be taken in English, Dutch or German language.

CHINA

No legal restrictions as yet throughout China.

JAPAN

License from Ministry of Interior.

Diploma and license from U. S. A.

Examination, oral, written, practical.

Reciprocity with Great Britain.

Japanese or in English.

KOREA

License.

Diploma and license from U. S. A.

Examination, oral, written, practical.

Reciprocity with Great Britain.

In Japanese, or by courtesy in English.

As medical men, we are all interested in keeping up and even raising the professional standards in medicine. As missionaries of the Gospel of Christ, we are interested in sharing with all races and peoples throughout the world the fullest knowledge and power over disease that modern medical science has given us. As our Lord and Master went about Galilee, Samaria and Judea using His power to heal those sick with divers diseases, so we medical missionaries have gone out even to the uttermost parts of the world using the best of modern medical skill to minister in His Name unto the sick and wounded among the nations. If we are true to Him we must give of the best. Only the best in us and from us is worthy of Him.

It should be, therefore, our earnest desire to raise the standards of our medical missionary work. We realize fully that at first in establishing medical missionary work in a pioneer field we are limited in the scope of our work, not only by poor equipment and inadequate financial support, but also because we must first gain the friendship and confidence of the people whom we would serve. It takes years often to build up this faith in modern medicine and its methods. We must have patience but we should still strive earnestly to do better and better work.

We recognize that governments must control the practice of medicine, and we should try and cooperate with them in every way that we can. Only by stringent laws can ill-trained or partly trained medical men be prevented from imposing themselves on the ignorant, destroying their confidence in modern medical science.

Yet in all the mission fields the supply of well-trained medical men is terribly inadequate to minister to the needs: In China one

doctor to two or three millions of people; in Africa no doctor for whole sections of that continent. The temptation often is to lower our professional standards or to resist the setting up of any standard by the government in control. I wonder if instead we should try to help establish fair and just standards for the practice of medicine in every land. Most of the mission boards now require that their medical candidates must be graduates of Class A medical schools with at least one year of internship here in the homeland. And we all strongly advise that the newly appointed medical missionary should pass his State Board examination and secure a state license before he starts for the field. In the last five to ten years we are advising that the candidate, if possible, pass the National Board examinations in place of, or in addition to, one of the state examinations, as the former will give him the right to practise in thirty-six of our states if he ever wants to retire from the mission work and set up practice here in this country. In securing his license in the homeland first, he can then meet this requirement wherever on the foreign field he goes, and it is also of a decided advantage to him if he has to take another examination for a license under another government. These requirements, as regards medical diplomas and examinations, in most cases seem just.

But in several countries there is an additional requirement of citizenship. We American physicians can hardly complain, for over half of the states exclude doctors of foreign citizenship from taking the examinations. And this exclusion is a form of protection demanded by our medical profession here in the homeland. Thus we cannot ask for reciprocity in dealing with other countries. They have the same right to set up the bars of citizenship against the entrance of foreign doctors. With the rise of nationalism in the Near East and the Far East the time is not far distant when the doors in other countries will be closed to the foreign missionary doctor. In Turkey no foreign doctor is permitted to take the examination for license. Only our medical missionaries and other foreign doctors who were established in practice before January 1, 1923, are allowed to practise. In India, where the Nationals are taking over gradually the control of the provincial medical councils, there is a growing opposition to foreign doctors, and in China it will not be long, if the Nationalist party gains complete control of that country, before some restrictions will be placed on foreign hospitals and on foreign doctors.

We need to study this problem as a whole and try and find some solution. It may be found through extension of the idea of reciprocity between nations as regards the license of physicians. It may possibly be by establishing an International Board of Medical Examiners whose certificates all countries will recognize. Some such solution will not only be of benefit to medical missions but would aid greatly in the exchange between countries of specialists in various lines of medicine, and in exchange of professors in medical schools,

but even more it may lead to exchanging between mission hospitals and denominational hospitals here in the homeland of the members of their respective staffs.

This is only a preliminary report. The subject needs further study. Cannot this problem be referred to some committee to bring in a fuller report with definite recommendations at our next conference, possibly two years from now?

MEDICAL WORK AT THE HOME BASE

J. G. VAUGHAN, M.D.

THE primary idea in this paper is to provoke expressions of judgment from the members of the Conference on the work of the medical representatives on the home base staffs. The collective judgment of a group like this representing medical work in the field is desired both to confirm and to correct methods and plans now in use.

I believe that in the work of home base medical organization, our English brethren have led us. Probably they have been aided by the more compact nature of their constituency which allows them more effectively to centralize their committee organization, and also by an apparently greater willingness on the part of the Christians and church leaders to allow an extra-board agency to cut across denominational lines in educating and soliciting in behalf of missionary hospital work. In America, and particularly in the United States, there seems to be greater protection thrown around the pools of missionary benevolence so as to bar from their shores any fishermen who are not born, bred, and branded within the denominations. It is hard to conceive of anything like the Edinburgh Medical Missionary Society prospering in the United States with the cooperation and blessing of missionary board administrators. For 84 years that Society has been carrying on in Edinburgh until it has trained over 250 doctors for missionary service under practically all the missionary societies of the British Isles. With the exception of two hospitals that it maintains in Nazareth and Damascus, its efforts for foreign medical work are limited to the training of students for their medical work abroad. At the present time twenty-five British students are in training who apparently receive an average annual grant in aid of about \$300. The total budget of this Society for 1927 was about \$40,000.

This is but one of a number of interdenominational—or undenominational—efforts in Great Britain in behalf of medical missions. There is over there a staunch spirit for the selection of medical missionary benevolence as an isolated type of work for promotion and for solicitation. We must recognize that there are evils as well as benefits from this individualization of types of work, but this one example, out of a number of possible ones, is cited to draw our attention

at the beginning of this study to the value of a united interdenominational effort in behalf of one or more of the problems of medical missionary work. Such united effort is now being done by the churches of the United States and Canada through the Medical Sub-Committee of the Committee of Reference and Counsel of the Conference of North American Boards. The very cumbersomeness of that title indicates the difficulty we have met at times and will again meet in the future in securing action on particular subjects. Nevertheless, excellent cooperative work is being done, as is evidenced by the calling of this Conference under the auspices of this committee.

I presume doctors and their work are not infrequently a problem to missionary administrators both on the field and at the home base. Each group of workers has its own particular adjustments that must be made before the machinery runs smoothly and effectively. We cannot deny that doctors sometimes are temperamental, as are other artists; and that their work usually involves a certain amount of absolutism that is not always secured without friction. Then, too, the cost of efficient medical work today is often disproportionate to other phases of missionary operation which is not always conceded by unsympathetic non-medical members of the missionary staff. The personal need for study both on the field and while on furlough, as well as the need for expensive books and journals, usually is more exacting and costly among doctors than is true of other forms of missionary service. To help meet these problems medical secretaries are valuable adjuncts to administrative staffs.

But the main work of a medical secretary, or a medical department, or a medical adviser can be grouped under four heads:

- I. Cultivation of physician and nurse candidates.
- II. Cultivation of the medical constituency of the church.
- III. Technical advice and fraternal cooperation regarding problems of the field medical work and personnel.
- IV. Direction of the health conservation program of the missionary personnel.

I. In the matter of candidate cultivation there is usually a candidate or personnel secretary of the board who bears the chief responsibility in this matter, and between this secretary and the medical secretary there needs to be a clear understanding to avoid confusion and duplication. Probably this understanding will involve that the medical secretary shall act as associate or joint candidate secretary on all medical candidates. He should carry the sole burden in determining professional efficiency and should share equally in all other phases of the cultivation within this group. This will require periodic visitation of hospitals and medical schools. With him, operating through an appropriate committee of the board, should rest all questions of determination of financial assistance which the board may grant to medical candidates in training.

II. The cultivation of the church in behalf of foreign missions is

usually assigned to some member of the home base staff and is a full man-sized job. There should be ready cooperation between this publicity expert and the medical secretary in the preparation of medical leaflets and special medical articles. Particularly in the approach to doctors in the church can a medical secretary be helpful to the publicity secretary. Our doctors within the membership of the church are sadly neglected as far as cultivation of missionary interest is concerned. Special leaflets or circular letters to reach them are well worth while. It is a notable fact that the church membership as a whole is quite responsive to the appeal for medical missionary work. Indeed, sometimes our non-medical missionary associates have been more prone to use the heart appeal of the medical work in seeking funds to support their missionary budget, than they have been generous in voting funds adequately to maintain the medical work. However, such injustice is comparatively rare and, generally speaking, medical support has in the past been fairly proportionate to the support granted other phases of the work.

III. In the matter of technical advice and fraternal cooperation granted to medical men on the field through a medical adviser on the home staff, it is quite possible for our anticipations to be much greater than our realizations. Distances are so great, correspondence so slow, and local conditions on the field so controlling that a swivel chair artist at the home base must beware lest his advisory contributions be more obstructive than helpful. Nevertheless, important mistakes would be avoided if an experienced and level-headed medical man at headquarters can let his judgment be brought to play on such matters as

- (1) Hospital plans.
- (2) Some general policies of hospital and dispensary operation.
- (3) Relative emphasis or degree of development of the various medical units.
- (4) Policies involved in hospital staff organization.
- (5) Difficulties of personnel adjustment rising from dissatisfaction or misunderstanding.

Most of the medical work on the field is in charge of such able and experienced medical men that a medical secretary at the home base is loth to urge his judgment. It is probably in the smaller boards that such judgment would be most helpful, and these are the boards who are least likely to have technical medical advisers.

Another important relation that the medical secretary has with the medical personnel of his board is related to the question of furlough medical study. I quite firmly believe that all boards should insist on six months vigorous and effective study for every furlough medical missionary. This should be financed by the board and should be done in closest cooperation with the medical secretary, who should himself be a constant student of the best postgraduate opportunities in various parts of the country.

IV. The health conservation program under the direction of the

medical secretary is usually the most important, the most time-consuming, and not infrequently the most embarrassing part of his task. If he rejects a candidate who has been nurtured and loved by the candidate department—especially when the health basis for rejection is subtle and none too apparent—he falls under the critical fire and hostile ire of both disheartened candidate and disappointed personnel secretary. If a furlough missionary is dilatory in giving full cooperation in the program for health restoration, or if such restoration is disappointingly slow, and return to the field on the appointed date is thwarted by the advice of the medical secretary, then again are seeds of discontent sown to the embarrassment of the medical secretary. Such decisions are difficult and worrisome indeed. What physician enjoys the responsibility of guaranteeing health three to five years hence in an individual having perhaps mild appendix symptoms too slight to insist on operation in the face of marked reluctance; or what one of us faces with equanimity an unsuspected, mild chronic ear discharge in a candidate who otherwise is in the best of health and rarely has earache; or a complete hysterectomy with ovariectomy at twenty in a young woman now for five years in apparently good health; or a young, apparently healthy mother who has had rather severe hyperemesis gravidarum; or an individual in apparent good health but with marked—30 per cent—overweight. These are some of my experiences of the last few weeks. I remember nearly ten years ago one of my first problems was a fine, attractive young woman candidate whose father was in the insane asylum. She had already been rejected by one group for missionary service. Everything else was altogether favorable. She was unusually acceptable on all the counts. When she came to me it was in an attitude of mingled hope and fear. If I rejected her it would be one more bond tying her to an outlook dark and hopeless. It would not be a decision, it would be a sentence. I looked carefully into the facts and believed I could risk it, so I approved her and she made good for six fine years of service, and then while in the homeland on furlough she tragically ended her life just because, I believe, she was downhearted and dreaded the future. Some day another case like that will come up and what can one do?

But these are the personal problems of the medical secretary that I did not intend to dwell upon. The great constructive facts are that he is intrusted with leadership and responsibility in safeguarding the millions of dollars invested by the church in precious human machinery. Once every five or six years it is his responsibility to study each of these vital machines and to direct the repair and overhauling. Probably this repair work will be directed by correspondence as the furlough missionary moves here, there and yonder visiting relatives, carrying some graduate courses, and making missionary addresses. But, thanks to the cooperation of our medical men all over this country, it can be done and it is being done with most gratifying results.

In conclusion I would point out that this brief paper has proposed to lay before you in broad outline the work of the home base medical secretary. We of the home staffs would seek your judgment as to the scope and method of our work. It seems at the present time to consist chiefly of:

- I. Cultivation of medical candidates.
- II. Cultivation of medical missionary interest in the church.
- III. Rendering cooperation and advice to medical folks on the field, and technical advice to the home staff secretaries as may be needful.
- IV. Conserving the health of the entire missionary staff.

You will note that there is no administrative function of medical work on the field ascribed to the medical secretary.

Medical work is a tremendous asset to the missionary program. In its simplest and purest form it is an almost unparalleled apologetic for Christianity. In the protection it affords to the health of the missionary staff it is of incalculable value. Yet the medical work of the American societies is not growing as such an estimate of its value would indicate that it should grow. Those of us who are home base medical officers need an appraisal of our duties and opportunities by this Conference in order to make our work more effective.

THE NEUROSES OF THE MISSIONARY

A. G. ODELL, M.D.

YEARS ago, when the writer was a small boy, the word "missionary" conjured up in the lad's imagination a wonderful personage with a sort of halo about his head. The lad was told that this person had left behind him all that made life worth living to the boy, and journeyed to far distant lands. There, among strange people with more strange customs, these halo crowned missionaries had wonderful adventures in lands whose jungles were filled with lions, tigers, rhinoceri, elephants, terrible snakes and other weird and awesome creatures of all sorts. While not having these adventures his time was occupied in teaching naked boys and girls about Jesus. The boy was given to understand that it was the same Jesus the Sunday School teacher talked about to the boy's Sunday School Class. If this missionary lived long enough by evading the strange animals and the stranger people, he could come back to the United States and tell the boys and girls of the churches and Sunday Schools about his wonderful experiences. Right from the boy's own town there was a woman who had gone to India. What a disappointment when the lad saw her for the first time! Why, she looked like his own mother, only a little older. The little chap began then to learn that after all has been said, missionaries were not very different from the folks he knew at home. Time dimmed the halo he had placed about the

head of the missionary. As the boy grew older he read more and saw more and more of these people, he became completely disillusioned. They were only common folks. What made them different was that they were common folks going about an uncommon task! They had their faults and failings like the stay-at-home folks he knew; but like them, they had some fine and beautiful characteristics as well.

The small boy has grown up now and somewhat the same has been his experience when the health of the missionary has been analyzed.

What with bad water supplies, lack of an appreciation of the laws of hygiene on the part of the native servants, often the inability to obtain proper food, and to have it properly cooked, the knowledge that in the overcrowded so-called heathen lands lurked germs, bacilli, parasites and what-not ready to pounce upon the unwary, most physicians undoubtedly feel that tropical and Oriental diseases should be found very frequently in the missionary group. Black water fever, yellow fever, typhus fever, bubonic plague, tapeworm, hookworm, etc., should appear very often. Such, I confess, would have been the writer's conception until in recent years. The past seventeen years have brought him more and more into contact with the missionary as a patient. Like the fading and final disappearance of the haloed person of wondrous experience with wild beasts and wilder people, and its replacement by the concept of the missionary as a "regular guy" (to use boy language), so there has come about a radical change in his medical concept of the missionary. He is not one suffering from these unusual (to the Occidental) diseases, but rather a person like those at home and afflicted with the same ailments in about the same proportion. When asked by Dr. Vaughan to read a paper at this meeting, a little of the old idea still persisted. A study of the records of 370 missionaries from the records of the Clifton Springs Sanitarium and Clinic has finally and completely removed the old idea. Many more than this number have undoubtedly been under treatment. It was difficult indeed, to get this many as the records are not at present cross indexed by occupation. It includes those only who gave their business as "missionary." It does not include all those now under treatment. To include these would add two cases of sprue and a few cases of fatigue but would not materially alter the figures. Home missionaries, nor those foreign missionaries retired from active service and living in the United States, are not included. Therefore, it seems like a fair cross section of the foreign missionaries on the active list at the time they were under treatment.

There are a number of charts accompanying this paper. Most of them are too long to read to you. The salient points only will be given:

When the 370 are arranged by sex and social status, the males number 102, of whom 96 are married and 6 single. Please note the great preponderance of married over single men. The relative dis-

proportion is not so great among the women, for of the 268, 101 are married while 159 are single. The social status of 8 was not obtained. Here again please make a note of the large number of single women. I believe it has some relation to conditions to be spoken of later.

Of these 370 missionaries, the field of work was not given for 63. China leads with a total of 82, 26 men and 56 women. From India came 60, of whom 15 were men and 45 women. Japan follows with 10 men and 42 women, a total group of 52. South America sent 19, 9 men and 10 women, and was closely followed by Korea with 4 men and 13 women. Persia and the Philippine Islands supplied 8 each and Syria 7. The numbers rapidly decrease with Burma, Turkey, Mexico, Egypt, Malaysia, Costa Rica, Bulgaria, Assam and New Zealand represented in the list. It is an interesting fact that of the 370 missionaries, 257 come from 6 countries; and that 4 of the 6, China, India, Japan and Korea are in Asia and supply 213, or nearly two-thirds of the entire group studied. To the Asia group should properly be added those from Persia, Burma, Malaysia and Assam, some 17 in all. This makes the Far East contingent number 230.

May I be permitted briefly to review the diagnoses among the different systems before taking up the distinctly neurological side of the paper?

Of the 370 studied, 9 males and 3 females were noted as normal. This means that there was found no physical or psychic defect worth noting in the records. I wonder if an average group of 370 folks in this country would show, if as carefully studied, any greater proportion of normals.

In the diagnoses relating to the head appear two outstanding sets of figures. One hundred and ten are noted as having diseased tonsils and 77 as having teeth showing alveolar abscesses.

The cardio-vascular group show 28 hypertensions, 9 males and 19 females, or a proportion of 2 to 1 in favor of the women. There were 7 males and 21 females with an hypotension, or 3 to 1. Secondary anaemia was noted in 83 cases, a pernicious or primary anaemia in 4 and an unexplainable eosinophilia in 8. The secondary anaemias come most largely from India and China. Of the 71 cases, whose station is known, India supplied 19 and China 18. This is a total of 37, or nearly one-half of the total list.

The respiratory tract shows 20 diagnoses in the list. Tuberculosis of the pulmonary tree in various stages leads the list with a total of 6. This number present in so carefully selected a group as is the missionary one, warns us against passing too carelessly over the chest in the group of those showing fatigue as the most prominent symptom. Often the fatigue is the first warning of pulmonary disease.

Comparatively few thyroid conditions were encountered. Simple adenoma in 8, and hyperthyroidism in 6 cases, head the list containing 23 cases.

Twenty people, 5 men and 15 women, were enough overweight to be called obese.

Ten women and one man had chronic appendicitis, 4 men and 24 women had sprue, while 3 men and 11 women suffered from chronic constipation. Other gastro-intestinal conditions appear in the charts, but too few to be mentioned at this time. An analysis of the incidence of sprue shows China in the lead with 15 cases, or more than one-half those in this series.

Chilomastix predominated among the intestinal parasites found. Many observers doubt the pathogenicity of chilomastix, lamblia and endolimax. Others feel they may have some relation to fatigue states among other conditions. In 12 only of the 91 cases of fatigue were any of these three organisms found. I do not believe they have any relation to the state of fatigue which was the complaint of the patient. No cases of infection with round or tapeworm and the like were found. This speaks well for the efficient treatment by the medical men on the field.

Chronic malaria was a frequent complaint, but only five proven cases were diagnosed.

The genito-urinary cases show no outstanding figures among either men or women. In the 370 histories reviewed, diabetes mellitus is recorded 7 and chronic nephritis 6 times.

In spite of the ever present danger of acquiring lues innocently no positive Wassermann reactions were obtained. Dr. Service of the Sanitarium staff, in a recent paper in the *Clifton Springs Bulletin*, reviewed our results in 20,000 tests. Of these 272 were positive. According to this rather low ratio, in the missionary group at least 6 or 7 positive results should have occurred. This again speaks well for the care taken by the missionary.

Nothing worthy of mention appears in the dermatoses listed, as only five persons showed anything of this nature and one of those was an angio-neurotic oedema which might better be among the neurological conditions.

Thirteen patients suffered from chronic arthritis.

Thus far nothing has been found which sets the missionary apart from his fellowman. There is, however, one point to be kept in mind when discussing this and the neuro-psychiatric problem. The missionary is a selected risk, as the insurance man would say. Not so would be a group of equal size taken at random from "Main Street" in any representative city or village in this country. This careful selection makes for a higher health standard than would otherwise obtain. It has taken some time to arrive at the group which gives this paper its distinctive name. The neurological group still remains to be studied.

There were 116 neuro-psychiatric diagnoses. If I had been asked before this study, to venture a statement as to the number, my guess would have been a much higher percentage, especially in the fatigue, the affective or emotional, and the anxiety states. The diagnosis of

fatigue was made 91 times. It occurred in 20 married and 3 single men; in 26 married and 42 single women. This bears about the proper relation to the different groups in the cases studied. As a matter of fact, I believe this diagnosis could have been made more frequently. The apparently few times it is recorded among the list of diagnoses attached to the records sent to the Medical Library being due to the fact that other conditions seemed of much greater import in the care of the patient. The habit of thinking on the part of the attending physician also has some relation to this question. My own belief is that perhaps twice as many could very properly be placed in this class. Of course, the degree of fatigue will vary greatly in different individuals, and it is often difficult to determine which is primary and which is secondary. Whether many of the so-called fatigue states are not really psychic and should be placed among the disturbances of the affects or emotions is also a real question. Very often in these individuals, the two states are so closely related that a separation is almost impossible. The dividing line between the two is very tenuous. The social status seems to bear little relation to this condition except that mothers with small children present this state very often. The care of the home even with plenty of servants (these in themselves an ever present problem), the bearing and rearing of children, the great amount of entertaining which often seems so necessary, the attempt to supplement the work of the husband which I believe should never be required of a mother, the acquirement of a language, the strange customs to be learned—all these and many other things add to the strain upon the mother. Thus is engendered a tendency to lessened vitality and an increase in the feeling of fatigue.

The number of affective conditions was a surprise, as 12 only are in the list. It is significant, however, that 7 are among single women. Does this mean that the single woman is more emotional than her married sister? Not at all. It means that the married woman has more outlets for her emotions. There are some facts which should be considered. It starts in her "dolly days" and with most women never leaves her. It has been suggested to me by a former missionary and now the editor of a missionary magazine that one of the reasons for so large a number of single women in the missionary group is this same maternal instinct. They see the millions of children who need loving and teaching and this appeal touches that spring of maternal instinct, and another missionary goes out to toil among an alien people for the love of Christ and in His Name. Most of these women face the fact that this virtually shuts them off from a home of their own with "children prattling at their knees." (Or doesn't the modern mother allow this any more?) This then involves a repression of strong instincts and from this repression, unless properly balanced and controlled, springs many an unpleasant situation. It brings up the question of homo-sexual relationships with the effects both moral and psychic upon those so related; and

also upon the people whom they are trying to influence. Some physicians go so far as to advocate such practices saying that this sort of sex expression is less harmful than is sex repression. 'Tis a pity that the medical profession has such minded members! While the purely physical effects may be less than was once thought, yet the moral struggle is a severe one and tends to upset the person and render her unfit for work. This diagnosis appears but once in the list. In this connection, note that masturbation was admitted by one patient, a single woman, and that there are recorded delusions connected with this habit and a psychosis connected with sexual ideas in one and two patients respectively. You will see that the proportion of this group to the total group is very small. These patients were those in whom the condition was frankly admitted or expressed. It does not include what may be a much larger group in which the sex instinct is playing a rôle, perhaps only partly if at all recognized by the patient. One case of vaginismus was undoubtedly a defense reaction against further pregnancies. If all patients could be induced to talk freely and fully, I believe this list would be much larger. Indeed many medical missionaries with whom I have talked admit the truth of this statement.

Seven cases of hysteria were diagnosed. These were not "shell-shocked" but "foreign-field shocked." Anxiety states appeared in five patients. Here again was another surprise! Is it because the missionary more than his stay-at-home brother has learned that God takes care of His own? Is it because he has a more wholesome religious life with more outlet? Is it because he is so busy that he has no time for worry? I'll leave you to answer the question. Or is it again a question of reticence?

Of the psychoses, only a very few were found in this analysis. Is it not rather strange that schizophrenia or dementia praecox (they are essentially the same and are usually environmental adjustment disorders) are found in two persons only? When the enormous number of social and spiritual adjustments and the strain in making these adjustments are taken into consideration, should we not be rather proud of the young people who go out to the foreign field? Your medical secretaries might feel the incidence was much higher. They have more intimate knowledge of the reactions of their people through the reports which come from the different stations.

The question was asked by one secretary as to the effect of station, climate, and the like on the incidence of nervous states. This has been plotted out for the group in the case of fatigue. In this group the Far East is represented by 49 individuals. The remainder of the group is very widely scattered. Of the individual countries China leads with 6 males and 17 females, or a total of 23, while Africa supplies 12 to the list with the sexes equally divided. Japan's 12 show 10 women to 2 men, while India's are all women. Can you draw any conclusions? I must confess that I cannot, unless it be that Central and Southern Africa supply more in proportion than do

other countries. It shows 12 out of 27, or 48 per cent. Its nearest competitor is China, with 28 per cent. Japan's contribution was 22 per cent and India's 16 $\frac{2}{3}$ per cent.

The question may be asked, "Are there any particular physical conditions which may cause the fatigue?" The accompanying table gives the result of this study. Three conditions stand out prominently. Secondary anaemia was found in 18 women and 1 man. For the purpose of this analysis 80 per cent was considered the minimum normal of haemoglobin and 4,000,000 the minimum red cell count. Infected tonsils were found in 3 men and 14 women with peridental infection or chronic alveolar abscesses in 2 men and 13 women. I believe the proportion is no greater than among an equal number of people living on this side of the ocean. It was somewhat perplexing to find only 6 persons in whom fatigue was associated with arterial hypotension. These were all women. One would think that many others should have shown this finding. No other conditions were found frequently enough to warrant a second thought in this connection. So far as the age incidence is concerned, it is just what one would expect. Just as the greater proportion of the missionaries are between 30 and 50 years of age, so two-thirds of these cases fall between these years and are almost equally divided between the two decades.

This question has been asked me by a friend of the missionary enterprise, "Does the missionary group as a whole make any better or any worse patient in the sanitarium than the average group?" If this had been asked five years ago, the answer would have been the disagreeable "Decidedly worse." There was a general disinclination on the part of the nurses to be eager to serve them. "They are so fault-finding, nothing seems to satisfy or please them; they forget there are such words as 'Please' and 'Thank you,' and they order us about as if we were menials." Of course even then there were those who did not do this, but they were the minority. It was hard to awaken very much enthusiasm concerning the missionary enterprise among the nurses. The situation now is entirely reversed. The disagreeable, unpleasant missionary is in the minority. The ones who have been at the sanitarium for the past three to five years have been uniformly those who would recommend Jesus to the folks about them. Of course, there have been exceptions to the rule, but remember that exceptions to the rule of courtesy are not confined to the foreign field.

Can anything be done to lessen the incidence of the nervous states just discussed? May I make some suggestions, putting them in the form of questions? They all spring out of personal observation. These suggestions may be impossible of adoption at the present time, but they are the result of considerable thought and most of them with specific cases in mind.

Can anything be done to increase the number of married women on the field? Mind you, I am not advocating a matrimonial bureau.

That, while it might be interesting, would throw an additional burden on the shoulders of some one already overburdened. The more normal the life abroad, the less will be the incidence of certain phases of the neuroses.

Can anything be done to lengthen the time the children can be with the parents and to shorten the time when others than the parents must assume parental responsibility? A missionary wrote me only last week, "The hardest part of going back is leaving our children here in America." During the formative period of the life of these children the parents will not be with them.

The question of the use of the furlough for doctors and nurses was discussed yesterday. What about the use of the furlough for those not doctors and nurses? Shall it be spent in study and deputation work with too little time for rest? How often have I heard the remark, "Speaking uses me up. I can't speak well and dread it, but our Board expects us missionaries to do so much speaking. Really, I am just as tired as when I came home six or eight months ago." Not once but in the majority of cases is there a sigh of relief when told that they will not be allowed to do any speaking while under the medical supervision. The question of study or research also enters into the matter of the writer. One lady told me that she returned to Korea after her furlough more weary than when she came home. She spent nearly all the time in study. Is this fair to the missionary or to the field?

Are the periods of service too long? Can they be shortened, with better results in the long run? Instead of an average of five or six years out and a year home with much work in it, could the term be three years with six months for real rest at home? Or if deputation work or study is desired, would it be feasible to have four years out with a year home? Then divide this year into an initial four months of real rest, four months of speaking or study, and a final period of rest and quiet before returning to the field? This suggestion, or rather question, is prompted by a statement from one missionary that, on his field, it took a year to get under way. Then followed two years of productive work with the fourth year showing production dropping rapidly. The fifth year the missionary was not worth having on the field. Whether or no this is a common experience is a question awaiting an answer.

What about those who are emotionally unstable, who show an inability to get along with their associates, or to do teamwork, or those who show a tendency to develop the shut-in, introverted personality of the schizoid? They are potential liabilities and not assets. Their going to the field for the first time, or their return after a furlough, is a debatable question, especially to such fields as China, where particularly disturbed conditions exist. It demands most serious consideration. I have under observation one such case at present. She is of the extremely pietistic type who seldom reads any fiction unless the biographies of missionaries and the like

come in this class. She does not mingle well with the other patients. Going to church is a diversion for her. She has the earmarks of a potential praecox. For her twelve to sixteen months in this country have been advised before her case comes up for consideration. She feels that this is a mistake and that no one is quite fair to her or understands her.

Can anything be done, and how, for the family either with or without children, who find the home allowance too small to live on in this country of prices so much higher than those on their station, and who welcome a return to the field because "we can live more cheaply"?

Is there any way whereby those passing on the physical condition of the applicant, either for first time out or for return, may have some knowledge of the conditions under which the applicant must live while on the field? Would it make any difference with the recommendation they make? In one case now under my observation, I am quite sure that a more carefully taken history and a knowledge of the field would have kept this missionary at home and saved a life which has become almost wrecked physically by the conditions under which she had to live and work.

What shall be done about those having attacks of migraine when these attacks occur four or five times a year or as often as each month at the time of the menses? In the nine cases present in this series, much time must have been lost each year because of the attacks.

Time does not permit me to speak of fear in its various aspects, mild cases of encephalitis, often mistaken for mild unexplained fevers and followed sooner or later by personality changes or the development of a paralysis agitans syndrome, the effect of light, especially the ultra-violet rays in the tropics in the development of tropical neurasthenia, the question of proper foods, with the green salad foods for their vitamin content in mind, a study of the motives which prompt the person in volunteering for foreign service (I believe this to be very important), and kindred other questions of importance equally as great as those already discussed, but especially that of their ability to give and take and to do teamwork.

What is the summing up of the whole matter? A study of the records of 370 missionaries at the Clifton Springs Sanitarium would seem to bear out the assertion that the missionaries who come there are no different from the average group of home base folks of approximately the same ages and sex. This has also been my own personal experience. They get tired and weary in about the same way and to the same extent as do other folks. They are no more subject to disorders of the affect or psyche than would be an equal number of as carefully selected people at home. They have the same aches and pains, the same hopes and fears, they react to success and failure and disappointment "even as you and I." In other words, they belong to that very large group whom the Lord loved because He made so many of them—the common folks.

Let me say in conclusion, as I did at the start, the small boy grown to manhood finds the missionary to be physically, mentally and spiritually just like other folks in every sense of the word.

DISTRIBUTION—BY SEX AND SOCIAL STATUS

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Married.....	96	101	197
Single.....	6	159	165
Status not noted.....		8	8
Totals.....	102	268	370

DISTRIBUTION—BY COUNTRIES

	<i>Male</i>	<i>Female</i>	<i>Total</i>
China.....	26	56	82
Not given.....	12	51	63
India.....	15	45	60
Japan.....	10	42	52
Africa.....	12	15	27
South America.....	9	10	19
Korea.....	4	13	17
Persia.....	4	4	8
Philippines.....	2	6	8
Syria.....	3	4	7
Burma.....	0	6	6
Turkey.....	1	5	6
Mexico.....	1	3	4
Egypt.....	2	2	4
Malaysia.....	2	0	2
Costa Rica.....	0	2	2
Bulgaria.....	0	1	1
Assam.....	0	1	1
New Zealand.....	0	1	1
Totals.....	103	267	370

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Normal.....	9	3	12
Eye			
Refractive Error.....			1
Ear			
Chronic Otitis Media.....			1
Nose			
Deviated Septum.....			5
Chronic Sinusitis.....			5
Throat			
Infected Tonsils.....			110
Teeth			
Pyorrhea.....			2
Alveolar Abscesses.....			77
Thyroid			
Adenoma—Simple.....			8
" Toxic.....			2
Goitre—Toxic.....			1
" Exophthaline.....			1
Myxoedema.....			1
Hypothyroidism.....			4
Hyperthyroidism.....			6

CARDIO-VASCULAR STATES

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Hypertension.....	7	18	25
" Essential.....	2	1	3
Hypotension.....	7	21	28
Myocarditis—Chronic.....			10
Endocarditis ".....			3
" Malignant.....			1
Auricular Fibullation.....			2
Cardiac Hypertrophy.....			3
Angina Pectoris.....			1
Tachycardia—Neurosis.....			3
" Paroxysmal.....			1
Arterio Sclerosis—General.....			5
" " Cerebral.....			1
" " Coronary.....			1
Phlebitis—Old.....			1
" Thrombo.....			1
Anaemia.....			
Secondary.....			83
Primary.....			4
Aplastic.....			1
Eosinophilia.....			
Unexplained.....			8
Leukemia.....			
Lymphatic.....			1
Respiratory.....			
Tuberculosis—Pulmonary.....			
Healed.....			1
Arrested.....			1
Latent.....			1
Minimal.....			1
Mod Advanced.....			1
Inactive.....			1
Peritonitis.....			1
Influenza.....			1
Pleurisy.....			
Fibrinous.....			1
Bronchitis.....			
Subacute.....			1
Chronic.....			6
Pneumonia.....			
Broncho.....			1
Asthma.....			2
Hay Fever.....			1

SECONDARY ANAEMIA—DISTRIBUTION

<i>Station</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
India.....	2	17	19
China.....	1	17	18
None Given.....		12	12
Africa.....		7	7
Japan.....		5	5
Korea.....		3	3
Brazil.....		2	2
Burma.....		2	2
Colombia.....	1	1	2
Mexico.....	1	1	2
Philippines.....		2	2

Siam.....	2	2	
Syria.....	2	2	
Turkey.....	2	2	
Argentina.....	1	1	
Bulgaria.....	1	1	
Persia.....	1	1	
Total.....	5	78	83
GASTRO-INTESTINAL			
	Male	Female	Total
Obesity.....	5	15	20
Gastritis—Chronic.....		1	1
Hyperchlorhydria.....		2	2
Hypo- and A- Chlorhydria.....	1	6	7
Jaundice—Obstructive.....		1	1
Cholecystitis—Chronic.....	1	5	6
Choletithiasis.....	1	2	3
Bile Duct—Stenosis.....		1	1
Diarrhoea.....		1	1
Colitis—Simple.....		5	5
“ Mucous.....	1		1
Sprue.....	4	24	28
Visceroptosis.....		7	7
Appendicitis—Chronic.....	1	10	11
Haemorrhoids.....	3	3	6
Adhesions—Abdominal.....		1	1
Constipation—Chronic.....	3	11	14
Hernia.....	1	3	4
Parasites			
Chilomastix.....			20
Amebiasis.....			10
Endolimax.....			8
Lamblia.....			7
Trichomonas.....			4
Loa Loa.....			2
Hookworm.....			1
Dysentery			
Amebic.....			5
Shiga.....			1
Malaria—Chronic (Proven).....			5
SPRUE—28 CASES			
Station	Male	Female	Total
China.....	3	12	15
Korea.....		4	4
India.....	1	2	3
Philippines.....		2	2
Siam.....		1	1
Burma.....		1	1
Japan.....		1	1
Costa Rica.....		1	1
Japan—one suspected case			
Sprue—accompanying conditions			
Secondary Anaemia.....			19
Infected Tonsils.....			7
Chronic Alveolar Abscess.....			8
Scattering.....			12
Parasites other than Monilia			
Trichomonas.....			1
Chilomastix.....			3

GENITO-URINARY

Wassermann Reactions—no positives obtained.

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Uterus			
Fibromyomata			9
Prolapse			1
Retroversion			4
Polypi			5
Cancer			1
Endometritis—Acute			1
Ovaries			
Cysts			1
Cervix			
Endocervicitis			1
Eroded			1
Laceration			3
Vagina			
Vaginitis			2
Cystocele			3
Rectocele			4
Perineum			
Caruncle (Urethral)			1
Pruritis Vulvae			2
Laceration			3
Bladder			
Cystitis			1
Polypi			1
Menopause			6
Locomotor			
Arthritis—Chronic			13
“ Rheumatoid			1
Sacro-iliac Strain			3
Pes Planus			2
Pronated Feet			1
Scoliosis			1
Osteomyelitis			2
Myalgia			2
Myositis			1
Varicocele			1
Prostate-Hypertrophied			2
Diabetes			
Mellitus			7
Glycosuria			1
“ Transitory			1
Hyperglycaemia			1
Nephritis			
Chronic—Male			4
“ Female			2
Renal Calculi			1
Skin			
Angioneurotic Oedema			1
Psoriasis			1
Pruritis—General			1
Nevi—Multiple			1
Ulcer—Foot			1

NEUROSES AND PSYCHIC STATES

	<i>Male</i>		<i>Female</i>		<i>Total</i>
Sex	M.	S.	M.	S.	
Social Status	20	3	26	42	91
Fatigue					

Affective states	1	4	7	21
Hysteria		2	5	7
Anxiety states	1	1	3	5
Depressions				
Involutional	1	1	2	4
Simple	1		2	3
Recurrent		1		1
Hypochondriasis	1			1
Psychasthenia		1		1
Psychoneurosis—Sexual			1	1
Delusions				
Masturbation			1	1
Depression				1
Persecutory (Paranoia)	1			1
Psychoses				
Sexual			2	2
Depression			1	1
Toxic (Thyroid)			1	1
Dementia Praecox			2	2
Homo-sexuality			1	1
Masturbation			1	1
Vaginismus		1		1
Neurosis—Traumatic	1			1
Insomnia			2	2

NEUROLOGICAL STATE

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Migraine			9
Chronic Encephalitis	1	1	2
Chronic Encephalitis with Paralysis Agit	1	1	2
Paralysis Agitans (Senile)	1		1
Sciatica	1		1
Cerebral Tumor—Suspected	1		1
Neuritis	1	3	4
Myalgia		2	2
Du Puytren's Contraction		1	1

FATIGUE—BY STATIONS

<i>Station</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
China	6	17	23
None given	2	12	14
Africa	6	6	12
Japan	2	10	12
India		10	10
Korea	1	2	3
Colombia	1	2	3
Assam		1	1
Borneo		1	1
Brazil		1	1
Bulgaria		1	1
Chile	1		1
Egypt		1	1
Malaysia	1		1
Mexico		1	1
Persia	1	1	2
Syria	1	1	2
Trinidad	2		2
Turkey	1	1	2

AFFECTIVE STATES—BY STATIONS

Station	Male	Female	Total
Korea	1	3	4
China		3	3
Japan		3	3
Siam		1	1
Turkey		1	1

ANXIETY STATES—BY STATIONS

Station	Male	Female	Total
India	1	2	3
Africa		1	1
Korea		1	1

FATIGUE—ACCOMPANYING CONDITIONS

	Male	Female	Total
Cataracts	1		1
Chronic Alveolar Abscess	2	13	15
Infected Tonsils	3	14	17
Sinusitis—Chronic	1		1
Deviated Nasal Septum		1	1
Myocarditis—Chronic		1	1
Angina- ?	1		1
Hypertension		2	2
Hypotension		6	6
Secondary Anaemia	1	18	19
Eosinophilia	1	2	3
Adhesions—Abdominal		1	1
Colitis—Chronic		1	1
Appendicitis—Chronic		2	2
Constipation—Chronic		5	5
Hyperchlorhydria		1	1
Achylia		4	4
Dysentery—Amebic		1	1
Amebiasis	1		1
Endolimax		2	2
Lamblia		3	3
Chilomastix	1	6	7
Thyroid			
Adenoma		3	3
Colloid		1	1
Nephritis—Chronic		1	1
Cystitis—Chronic		2	2
Renal Calculus	1		1
Migraine		2	2
Insomnia		1	1
Hysteria		1	1
Pulmonary T. B.—Inactive		1	1
Uterus			
Retroversion		2	2
Polypi		1	1
Endometritis—Chronic		1	1
Ovary			
Cysts		1	1
Vagina			
Cystocele		2	2
Rectocele		1	1
Vaginitis		1	1
Menopause		1	1

AN ABSTRACT OF A STUDY OF THE HEALTH OF MISSIONARIES

DR. GEORGE T. TOOTELL

Introductory and explanatory remarks by DR. E. M. DÓDD

It can be said of the medical secretaries of the Boards that we are very anxious to have our medical records studied in order better to understand our health problem and improve our efforts in this connection. The great difficulty is to find the time or the persons to do this. In our case we were fortunate in having an enthusiastic student of such material at home on furlough in Dr. Tootell. And he put in some three months hard work in the office going over the records of one-third of our active force—all that he had time for.

To my mind there are at least three reasons for presenting this report here, though unfortunately it is only possible to present a part of it either here or later in printed form.

1. In the first place the actual facts brought out are of significance.
2. In the second place the whole study will serve as a base line for future studies. It may be incorporated into a larger study for which we are trying to arrange.
3. And in the third place we wish to demonstrate that we are making serious efforts to do scientific work in our health program.

STUDY BY DR. TOOTELL

Such questions as the following: "Is it not possible to urge a more careful physical examination of candidates and reject those having nervous tendencies or slight physical defects?" caused us to consider a review of our missionary personnel. Accordingly, this was started in November. The statistical study of "The Health of Missionary Families in China" by Dr. Lennox, and "A Comparative Study of Missionary Families in Japan and China with a Selected Group in America" by the same author, also "The Causes of Invaliding from the Tropics" by Dr. Price of London, were of great value to us in emphasizing health conditions which missionary families have to contend with.

We also hoped that this review might prove of great value to us in showing where the missionary stood in regard to physical fitness, and as an aid to the Board's Medical department in choosing future candidates. Helpful suggestions referable to health measures were also contemplated, and we hope later to compare the results of our findings with those of other Boards.

The review divides itself into three courses:

1. Investigation of the *health* of a certain percentage of missionaries now in active service.
2. A consideration of health *furloughs*, *deaths*, and *resignations* due

to other causes, which have taken place during the last six years 1920-26, namely, since the Board's Medical department has been established.

3. Consideration of the question of *missionary mothers and birth-rate*.

In regard to Chart No. 1 (see close of this paper), 543 missionaries' reports were selected at random from the files. Our total force being 1608 missionaries last year, these studies represent, roughly, one-third of those in active service. And we have endeavored to keep this proportional quota for each mission. Obviously, two-thirds of the entire force were not reviewed; but it was felt that the percentage studied would give us the working knowledge necessary for desired results.

A word might be said about our tabulation of cases. As the medical history was received, it was numbered and the same numeration used on all our charts. This gave us the final findings under the number instead of under the missionary's name, and helped us to review each case impartially.

We endeavored to tabulate the various doctors sending reports in to the Board, in order to check up their diagnoses; but this did not prove feasible owing to the numerous physicians from New York to San Francisco and from Montreal to the Gulf who have rendered services in the past. But on general principles it seemed best to advise using, for health examinations, those physicians who are recommended by the Board. These, for the greater part, have an interest in the missionary enterprise and are suggested by the Board because their past service has been most satisfactory.

SUMMARY OF RESIGNATIONS 1920 AND 1921 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Married lady, age 50, 20 years service; has had malaria, appendectomy, gastroenterostomy, nervousness.	Neurosis
Married lady, age 38, 9 years service; has had malaria, hook-worm, dysentery, and nervousness.	Amoebiasis
Married lady, age 39, 7 years service; has had typhus, typhoid, and malaria fevers.	Neurosis
Married lady, age 38, 9 years service; had has nervous tension.	Neurosis

SUMMARY OF RESIGNATIONS 1921 and 1922 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Married lady, age 31, 4 years service; has had goitre, malaria, nervousness, appendectomy, flu, pregnant twice, one still-born.	Adenoma of the thyroid
Married man, age 34, 4 years service.	Pulmonary Fibrosis
Married lady, age 37, 7 years service; has had pleurisy, dysentery, D. and C. operation, appendectomy, ovariectomy, suspension of the uterus, colitis, and nervousness.	Neurosis
Married lady, age 37, 8 years service.	

SUMMARY OF RESIGNATIONS 1922 AND 1923 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Single lady, age 41, 5 years service; has had diarrhea and deafness.	Deafness
Married man, age 42, 16 years service; has been nervous, has had flu and tonsillectomy.	Psychoneurosis
Single lady, age 38, 4 years service; has high blood pressure, cardiac enlargement, retinal hemorrhage, rheumatism, tonsillectomy, a nervous breakdown, nephritis, unilateral deafness.	Chronic nephritis
Single lady, age 27, 3 years service; has had turbinectomy, flu, and nervous breakdown.	Acute mania
Married man, age 41, 14 years service; has had typhoid malaria, bronchitis, asthma, dysentery, tonsillectomy, and pulmonary tuberculosis.	Pulmonary tuberculosis
Single lady, age 38, 9 years service; has had malaria.	Chronic malaria
Single lady, age 38, 2 years service; has had rheumatism, tonsillectomy, dengue fever, appendectomy, suspension of the uterus, and pulmonary tuberculosis (?).	Chronic neurosis
Married man, age 65, 34 years service; has had anemia.	Pernicious anemia
Single man, age 31, 1 year service; has had colitis and diabetes.	Diabetes
Married man, age 31, 5 years service.	Sprue

SUMMARY OF RESIGNATIONS 1923 AND 1924 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Married lady, age 48, 15 years service; has had filaria, appendectomy, and suspension of the uterus; D. and C. operation, 2 miscarriages, and 2 children; also a valvular heart lesion.	Angina pectoris
Married man, age 38, 12 years service; has had a gastric ulcer causing hematemesis.	Gastric ulcer
Married woman, age 45, 15 years service; has had malaria and laparotomy.	Neurosis
Married man, age 53, 9 years service; has had aphasia following cerebral hemorrhage.	Cerebral hemorrhage
Single lady, age 65, 31 years service; has had muscle atrophy and hemoptosis.	Arthritis

SUMMARY OF RESIGNATIONS 1924 AND 1925 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Single lady, age 33, 3 years service; has had malaria, influenza, typhoid fever, tonsillectomy and peritonsillar abscess.	Neurosis
Married lady, age 55, 5 years service; has had dysentery and appendectomy, a nervous condition and cholecystitis.	Psychoneurosis
Single lady, age 40, 16 years service; has had a nervous condition, healed pulmonary tuberculosis and adenoma of the thyroid.	Neurosis
Single lady, age 36, 6 years service; has had malaria, tonsillectomy and dysmenorrhea.	Dementia praecox
Single lady, age 34, 7 years service; has had pyelitis, chronic appendicitis and cholecystitis	Renal tuberculosis
Single lady, age 34, 6 years service; has had appendectomy, influenza, typhoid fever, operation for sus-	

pension of the uterus, pulmonary tuberculosis. (Mother and mother's brother both died of pulmonary tuberculosis.)	Pulmonary tuberculosis
Married man, age 36, 12 years service; has had nephritis.	Nephritis
Single lady, age 51, 21 years service; has had appendectomy, influenza, typhoid fever, tonsillectomy, hysterectomy.	Neurosis
Single lady, age 34, 7 years service; has had appendectomy, malaria, influenza, amoebic dysentery, cystitis, typhoid fever and tonsillectomy.	Amoebic dysentery

SUMMARY OF RESIGNATIONS 1925 AND 1926 DUE TO MEDICAL REASONS

<i>Case Description</i>	<i>Diagnosis</i>
Married lady, age 38, 6 years service; has had tonsillitis, dysentery, and nervousness.	Neurosis
Married man, age 31, 4 years service; has had dysentery, tonsillectomy, nervousness.	Psychoneurosis
Married man, age 47, 21 years service; has had high blood pressure, tonsillectomy, articular rheumatism, malaria, dengue fever, and appendectomy.	Arthritis
Married lady, age 35, 7 years service; has had malaria, rheumatism, influenza, nervous tension.	Neurosis
Married man, age 46, 18 years service; has had tonsillectomy, dysentery and giardia infection, lung abscess.	Lung abscess
Married lady, age 48, 20 years service; has had malaria, cholecystectomy, appendectomy, nervous tension, ethmoiditis, hyper-acidity, dysentery, gave birth to four children.	Neurosis
Single man, age 55, 32 years service; has had herniotomy, jaundice, bronchitis, malaria, gastroenteritis, and sprue.	Sprue
Married lady, age 45, 17 years service; has had glucosuria and sprue.	Sprue
Married lady, age 34, 4 years service; has had malaria, influenza, rheumatism, cardiac collapse reasons for early tonsillectomy.	Mitral insufficiency
Single lady, age 32, 4 years service; has had chronic appendectomy, Lane's kink, pulmonary tuberculosis, unilateral deafness.	Deafness
Married lady, age 33, 5 years service; has had appendectomy, cholecystectomy, enteroptosis.	Cholecystitis
Married man, age 36, 12 years service; has had malaria, sprue.	Sprue
Single lady, age 34, 3 years service; has had dengue fever, dysentery, appendectomy, been hysterical and nervous (history of psychosias).	Dementia praecox
Married man, age 48, 14 years service; has had typhoid fever.	Neurosis
Single lady, age 30, 6 years service; has had dysentery, trachoma, iritis, and nervousness.	Neurosis

REMARKS BY DR. DODD

I would draw your attention to the high incidence of the general group of conditions we speak of as nervous, or better as nervous-psychic (or perhaps best of all as emotional). This is our most difficult and most baffling problem.

SUMMARY OF HEALTH FURLONGHS FOR 1920-26 INCLUSIVE AS RELATED TO
SINGLE LADY MISSIONARIES

Total number of missionaries	16
Average age	37 years, 6 months
Average service on the field before resignation	7 years, 8 months

<i>Missions Represented</i>	<i>Number of Missionaries</i>
Kiangnan	3
Persia	2
Philippines	2
South China	2
Hunan	1
India	1
Japan	1
Korea	1
North China	1
Shantung	1
Syria	1

Diagnoses for health furlough:

<i>Disease</i>	<i>Number of Cases</i>
Nervous:	
Neurosis	5
Dementia praecox	2
Acute mania	1
Deafness	2
Tuberculosis:	
Pulmonary	1
Renal	1
Malaria	1
Arthritis	1
Chronic nephritis	1
Dysentery	1

Notes on the Neurosis cases of this group

Two each came from Shantung and the Philippines; and one each came from Central China, Korea, Japan, North China, Syria.

Five of the above had histories of nervous conditions. One, in addition, had had a *hysterectomy*. On the other hand, two cases who were not invalided home for neurosis but for other reasons, had a history of a nervous breakdown, and a laparotomy with a possible pulmonary tuberculosis, respectively.

SUMMARY OF HEALTH FURLONGHS FOR 1920-26 INCLUSIVE AS RELATED TO
SINGLE MEN MISSIONARIES

Total number of missionaries	2
Average age	43 years
Average service on the field before resignation	16 years

The *diagnosis* in one case was *sprue* and in the other case *diabetes*. In the latter, through an oversight the condition was not discovered until the man had reached the field. With the case of *sprue*, there is a past history of malaria, bronchitis, jaundice, and gastro enteritis. He had also had an *herniotomy*.

SUMMARY OF HEALTH FURLOUGHS FOR 1920-26 INCLUSIVE AS RELATED TO
MARRIED MEN MISSIONARIES

Total number of missionaries.....	13
Average age.....	42 years, 1 month
Average term of service on the field before resignation.....	13 years, 4 months

<i>Missions Represented</i>	<i>Number of Missionaries</i>
Central China.....	2
Kiangnan.....	2
Philippines.....	2
Shantung.....	2
Africa.....	1
North China.....	1
Siam.....	1
South China.....	1
Yunnan.....	1

Diagnoses for health furlough:

<i>Diseases</i>	<i>No. of cases</i>
Neurosis.....	3
Sprue.....	2
Arthritis.....	1
Cerebral hemorrhage.....	1
Lung abscess.....	1
Gastric ulcer.....	1
Pernicious anemia.....	1
Nephritis.....	1
Pulmonary fibrosis.....	1
Pulmonary tuberculosis.....	1

Of the cases of neurosis, two had had histories of nervous symptoms. One followed a period of typhoid fever. They were from Kiangnan, North China, and the Philippines.

Regarding the sprue, one came from Kiangnan and the other from Siam.

SUMMARY OF HEALTH FURLOUGHS FOR 1920-26 INCLUSIVE AS RELATED TO
MARRIED WOMEN MISSIONARIES

Total number of missionaries.....	16
Average age.....	40 years
Average term of service on the field before resignation.....	9 years, 6 months

<i>Missions Represented</i>	<i>Number of Missionaries</i>
Hunan.....	3
Africa.....	2
Siam.....	2
Central China.....	2
Hainan.....	1
India.....	1
Mexico.....	1
Persia.....	1
Philippine Islands.....	1
Shantung.....	1
South China.....	1

Diagnoses for health furlough:

<i>Disease</i>	<i>No. of cases</i>
Adenoma of thyroid.....	1
Amoebiasis.....	1
Angina pectoris.....	1
Cardiac lesion.....	1
Cholecystitis.....	1
Neurosis.....	9
Psychoneurosis.....	1
Sprue.....	1

Of the ten neurosis cases, one was due to chronic fevers. Eleven of the above group gave a past history of a nervous condition: One of these was due to adenoma of the thyroid; one to cardiac lesion; one to amoebiasis, and one to an operation with insufficient time for recuperation before returning to the field.

Of those having neurosis, three came from Hunan, and one each from Hainan, Mexico, Persia, the Philippines, Siam, Shantung, and South China.

In these summarized totals you will see that the figures for the three chief groups stand:

1. Single women..... 16
2. Married men..... 13
3. Married women..... 16

At the first sight, since I have been accustomed to think that we have about the same number of single women as married women, I thought that this equal finding dealt a blow to our impression that in general single women presented more of a health risk than married women. But on analysis I saw that Dr. Tootell states elsewhere that the study is based on the following proportion:

Married.....	79.1
Single.....	39.8

There were therefore nearly twice as many cases of married women considered. If the breaks were equal, we should therefore have had a 100% higher figure in the married group. Evidently then this study would bear out the impression that the percentage of "casualty" among the single women is distinctly higher.

SUMMARY OF REASONS FOR LEAVING FIELD

Year	Single Women	Married Women	Single Men	Married Men	Accompanying Wives	Accompanying Husbands	Deaths	Other Reasons	Per Cent due to Health Resig. Excluding Consorts	Per Cent due to Health Resig Including Consorts
1920-21	0	4	0	0	0	4	11	41	6.6	13.3
1921-22	1	2	0	1	0	1	12	49	6.	7.5
1922-23	5	0	1	4	4	0	11	58	12.	16.8
1923-24	1	2	0	2	1	1	9	37	9.4	13.2
1924-25	7	1	0	1	1	1	13	40	14.	17.
1925-26	3	6	1	5	5	6	13	38	19.4	33.7
Total	17	15	2	13	11	13	69	263	11.6	17.8

	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26	Total
Deaths.....	11	12	11	9	13	13	69
Health resignations..	8	5	14	7	11	26	71
Consorts.....	4	1	4	2	2	11	24
Other causes.....	41	49	58	37	40	38	263
	64	67	87	55	66	88	427

AVERAGE PERCENTAGE OF CHILDREN PER MOTHER

Country	Number of Children	Average per Mother
China.....	443	2.7
India.....	226	3.
Persia.....	75	2.3
Syria.....	31	3.1
Mosul.....	2	1.
Japan.....	48	3.2
Chosen.....	189	3.4
Siam.....	85	2.9
Philippines.....	68	2.8
West Africa.....	69	2.5
Central Brazil.....	14	3.5
Southern Brazil.....	29	2.6
Chile.....	21	2.1
Columbia.....	20	2.5
Guatamala.....	13	2.6
Mexico.....	19	2.1
Venezuela.....	2	1.
Total.....	1,354	

An average of 2.85 per cent per mother.

SOME COMPARATIVE FIGURES BETWEEN LENNOX'S REPORT AND OUR REPORT

	Lennox's Report		Our Report	
	Number of Families	Number of Children Born per Family	Number of Families	Number of Children Born per Family
Missionaries in Japan.....	189	3.	48	3.2
Missionaries in China.....	1300	2.8	443	2.7
Childless Marriages:		Percentage		Percentage
Missionaries in Japan.....	29	16.3	20	25.
Missionaries in China.....	172	13.1	190	16.4

Referring to the Incidence of Smallpox

Among the 543 missionaries whose blanks were examined—these all in active service—there were six who gave a history of having had smallpox. None of these occurred since the year 1920. Three of these contracted the disease in this country before going to the field. Three others became infected on the field—one in the Philippines in 1919, one in India in 1919, and one in India in 1920.

Referring to the Incidence of Typhoid Fever

Forty-two missionaries had contracted the disease—twenty before leaving for foreign service and twenty-two while on the field. Four of those on the field were infected in Persia—one in 1925 and three during 1918. Four were infected in the Punjab—one in 1909, one in 1910, one in 1917, and one in 1921. Three were infected in West India—one in 1911 and two in 1918. Two were infected in Chili—one in 1917 and one in 1925. Two were infected in Siam—one in 1922 and one in 1923. And each were infected in the following locations: Columbia in 1885, Korea in 1915, Hunan in 1906, Brazil in 1917, The Philippines in 1917, Mexico in 1913, and Shantung in 1896. It is interesting that only four of these have occurred since 1921.

DR. DODD'S CONCLUDING STATEMENT

This very carefully done study should be utilized to the fullest. And we hope that such studies will be a stimulus to further researches.

I might say, in conclusion, that one of the important recommendations of the Baltimore Conference of two years ago for a combined health study of Board records by some outside qualified agency has been in process of being carried out. Such a study was actually begun over a year ago, and was then interrupted. Negotiations are now under way for a resumption of the study. And we hope that this can be successfully arranged for.

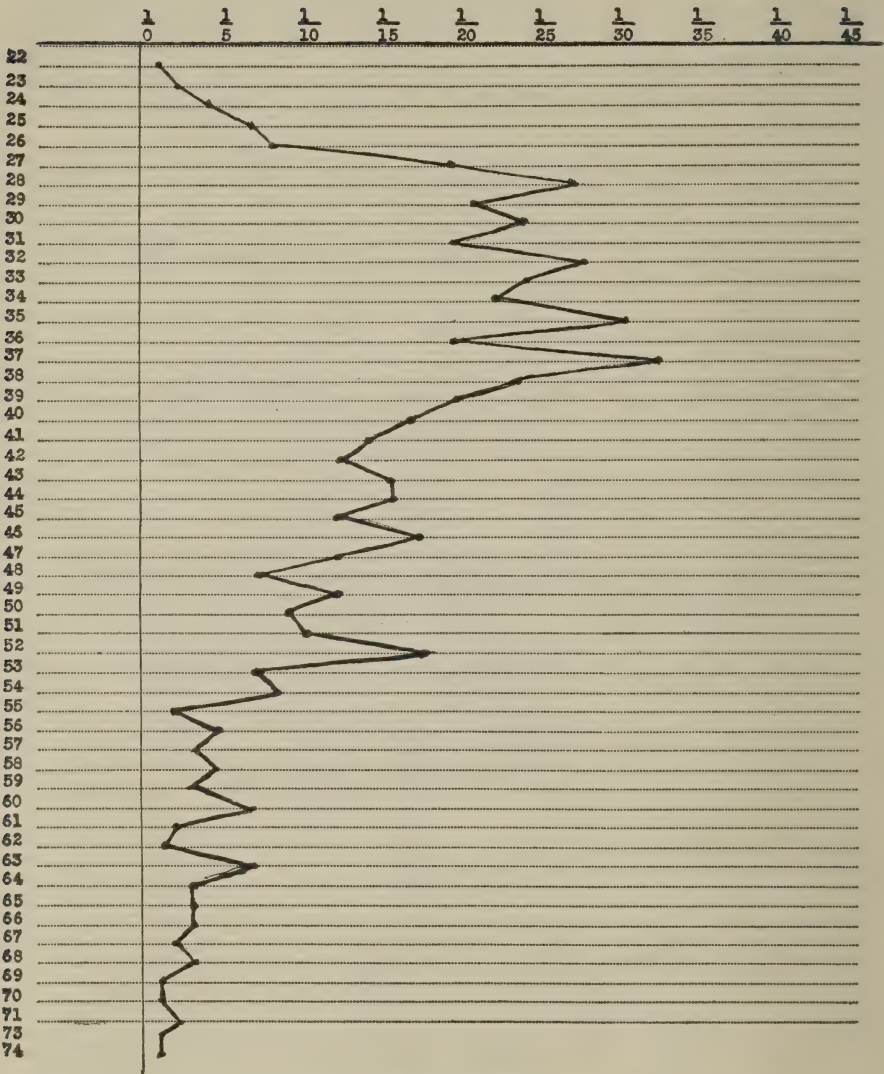


CHART SHOWING AGES OF MISSIONARIES WHOSE 543 MEDICAL RECORDS WERE REVIEWED

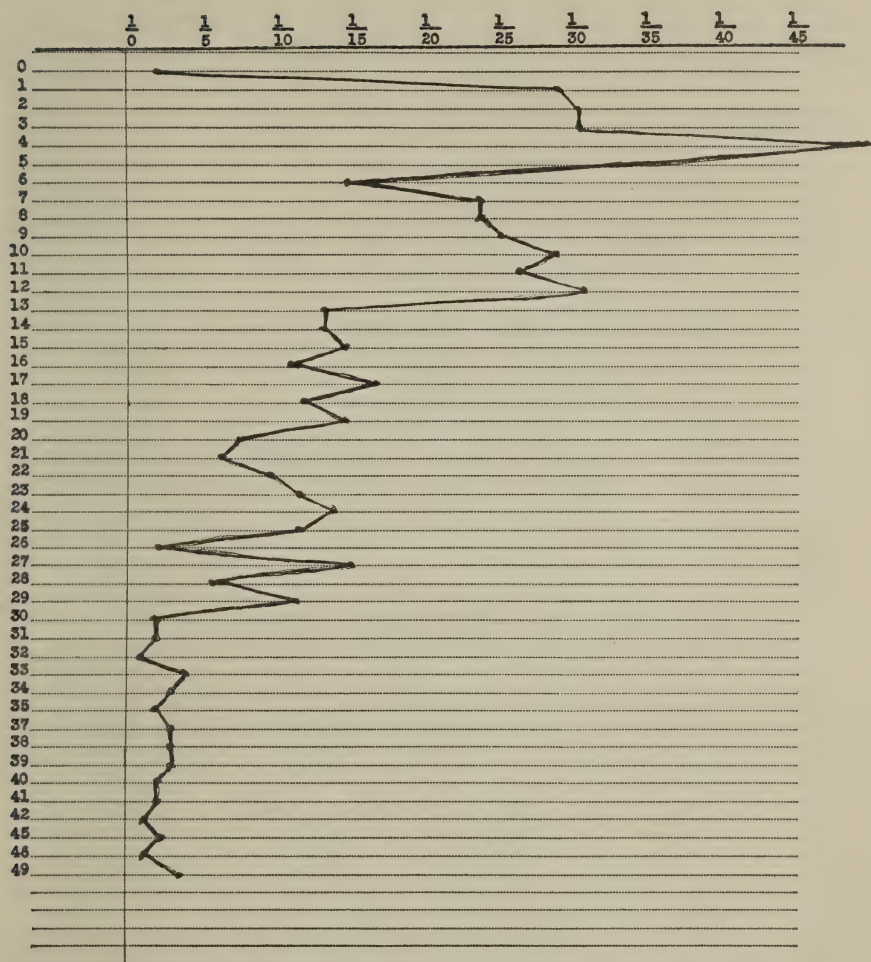


CHART SHOWING YEARS OF SERVICE OF MISSIONARIES (543) WHOSE MEDICAL RECORDS WERE REVIEWED

SELF-SUPPORT FOR MISSION HOSPITALS

DR. E. C. CORT

ALTHOUGH this is a group coming from the far corners of the earth, I imagine that their knowledge of Siam, like that of the average American, consists of two items—Siamese twins and white elephants. Interestingly enough, they are both wrong, since the Siamese twins were Chinese and the white elephants are not white. Siam, one of the most interesting and progressive countries of Asia, deserves careful study and interest. The Siamese, or Tai, as they call themselves,—the word Tai meaning free,—were driven out of their ancestral home, which extended all over the belt of the Southern Provinces of China from Yunnan to Kwangtung, in the early years of the Christian era. They emigrated rather than remain as a conquered people; and it is interesting that after all these centuries they are still a free people, since within the last two years all the nations of Europe and America have signed treaties giving up extra-territorial privileges in Siam.

The progress of the country has been very rapid. Twenty years ago it took me seven weeks in a little river boat to go from Bangkok to Chiangmai. We came out a short time ago in twenty-six hours, on a comfortable express train, with compartment sleepers, dining-car service, etc. At that time two or three ancient victorias and a couple of dog-carts were the only wheeled vehicles in the north. Now we have motor bus service running out from the City in five directions over good macadamized roads, with hundreds of motor cars and thousands of ox-carts. Siam is developing a system of education, with compulsory education in most of the centers, which is being extended as rapidly as teachers can be trained. There has been successful air mail service for three or four years, and recently the great Red Cross Hospital in Bangkok has acquired two airplane ambulances. Equally great progress has been made in our medical work in Chiangmai. Even when I returned six years ago we were still working in a dilapidated inn which was called by courtesy a hospital, to which the patients were brought by their friends and relatives, who were responsible for the feeding and the nursing care. Sometimes the whole family came except the family dog and the family buffalo, and occasionally the dog arrived too. To you who have been working under perhaps similar conditions no explanations of the difficulties and strains involved in this method need be mentioned. We now have a modern 84-bed hospital, with nurses' training school, diet kitchens, and all that goes with the complete care of the patients.

In Siam the Mission had the unique distinction of not only having originated medical progress, but of having this fact warmly recognized by the government. It is a popular thing for a certain type of globe trotter to come back and report on the inefficiency or injurious

effect of missions. Recently a very interesting conversation took place on the International Express coming from Singapore to Bangkok. A prince, cousin of His Majesty the King who was Minister, of Health, had been a delegate to a medical meeting in Singapore, and was returning with an American doctor who was a visitor at this same conference. The doctor opened the conversation with the prince by saying, "I suppose that in Siam, like the other countries of Asia, you are suffering from a pest of these missionaries who have brought in propaganda that disturbs and upsets your people." The prince quickly replied, "I beg your pardon, sir, but we do not feel that way in Siam. We realize that the American Mission introduced modern medicine and modern surgery into Siam, and to a very large extent modern education, and that in their hospitals, leper asylums and school they are still doing a tremendous service for our people, so that we are glad to consider the American missionaries as our very good friends." This being the case, we felt very strongly the need of improved facilities for our medical work, since we had been the leaders in all these matters and the relief of suffering had been introduced in the name of the Great Physician. It seemed to us unworthy of Him that we should still continue to work under these outgrown and insufficient conditions when the Siamese, following our lead, had gone far beyond the standards which we were maintaining. We were able to secure funds from America, principally from the late Mrs. McCormick of Chicago, to begin our plant, which consists of a large four-ward building, surgical building, European ward, kitchens, and a maternity ward, etc. When the time came for opening this new plant the Mission urged that while we needed these new buildings it would be necessary to carry on in the old method, since as we were on a self-supporting basis it would be utterly impossible to support the hospital on a modern basis if we assumed the full nursing, feeding, and other care of the patient. Dire failure and financial crash were predicted if we undertook this new adventure; but for the reason that we needed the new building we more urgently needed modern methods for caring for the sick if we were to properly represent the Christ whom we had come to serve. So against the advice of our friends we opened on a modern basis. Last year, although nearly 40 per cent of our patients were absolutely free, and another 20 per cent paid only part of the actual cost of their maintenance, we finished the year with a slight credit balance in our account.

The subject that has been assigned to me is "Self-Support for Mission Hospitals." Since our conditions, our people, and their resources are so different, I felt that the only way of presenting this problem was to tell how we had done it, and allowing you to select any suggestions that might apply to your own local conditions. I might say in passing that several interesting developments had to be made in order to make our diet adequate and possible. For instance, milk, except from a tin, was practically impossible to obtain in any quantity, the cattle of Siam being beef and transport animals,

and not a dairy breed. We secured a few good Anglo-Nubian goats in Bangkok and have developed a successful dairy which is furnishing all of the milk required for the hospital at less than one-half the current market price; and we hope to further develop this so that by sale to the European community and to well-to-do Siamese we will be able to furnish practically a free supply of milk to the hospital. We have also effected economies by raising our own chickens and vegetables.

The sources of our support are four-fold. The first source is from fees. The hospital's fees are decided upon by the head clerk, who is a Christian elder of wide experience and acquaintance throughout the entire district. In case of doubt we have always made it a point to err upon the side of leniency and be imposed upon rather than impose hardship on the patient. But we have been able to educate the well-to-do to the point where they are willing to pay large fees. No longer ago than the time of my arriving on the field these Buddhist people still considered that they were doing us a great favor in allowing us to treat them or operate on them, and thus make great merit at their expense, and if any fees were to be paid we should rather pay them than they us, since we were accumulating such enormous merit at their expense. We have been able to change this attitude so that now they recognize that in paying fees to the hospital they are making it possible to care for the sick poor, and thus are themselves making merit, so that when they pay our fees they are killing two birds with one stone—paying for their own care and making merit by caring for the sick. I recently collected a fee of nearly one thousand dollars from a prince for an operation, which was paid gladly.

Then psychology has a part. Dr. McKean had an interesting experience a few years ago which illustrates this. When he was in charge of the hospital an Indian patient arrived who was asked to pay 25 ticols (about \$10) for his care. He remained in the hospital only two days and then ran away. A week later he returned in very much worse shape, and Dr. McKean, in order to impress upon him his guilt in thus running away, refused to take him in unless he paid 100 ticols. He planked this down very gladly and said, "Now I will stay for I am sure I will get first-class treatment." A few years ago I operated on the daughter of the feudal prince of the province where we were working. I sent what I considered a large bill, namely, 500 ticols, and found that they were expecting a bill of 2,000. So they were disappointed, and so was I. But it is a fact that they respect you more if they feel that you are able to charge considerable fees.

The second element in our support is from calls. We have secured the most cordial cooperation from the Europeans in our district, one of our buildings being a splendid private ward building for European and American patients, a gift of British timber firms. For many years we have been caring for the Europeans of our district and making at times long journeys into the jungle to rescue some of these

men when seriously ill. I have crossed over into Burma on three different occasions to bring out very sick Englishmen. On my first trip, which was in the middle of the rains, the water was coming into the gate of the hospital compound 18 inches deep, so that you can imagine that a 150-mile journey over bridgeless streams and jungle roads was one of much difficulty; but it has borne fruit in the friendship and cordial support of the entire community. In the same way we have made calls far and wide on the Siamese, Chinese, Indians, or other nationals, who are living in our district. These have brought financial return in many cases, but have also established friendly contacts and shown our readiness to serve without regard to the cost to ourselves, that has helped to establish the relationships that we have with our community.

Another important item of our income is from the sale of medicine. Sixty years ago Dr. McGilvary had to hire the first patient to take the first dose of quinine ever given in North Siam. Now quinine can be found on sale in the most distant villages throughout the entire plain, and is sold by the hundreds of thousands of tablets yearly. In connection with these sales we have been fortunate in having a very keen business man with an able imagination in the person of Dr. McKean. A few years ago we found that Chinese vendors were selling quinine tablets purporting to be five grains, which really contained only a grain or less, and that they were claiming that they were mission-made products, trading upon our good name and injuring it. Dr. McKean sent for a tablet machine and had dies made, one side with the letters A. M. for American Mission, —Aw Maw in the Siamese characters,—and on the reverse side a figure giving the quinine content of the tablet. In the old days quinine was known as the white medicine. Their own medicine consisted of decoctions and pounded roots, and was dark brown in color and probably in taste, so that the first foreign medicine which they saw was the white quinine powder, so that it has been known far and wide as the white medicine. However, now quinine is known throughout our district as Aw Maw medicine. Recently a Siamese Government doctor who was out in the country caring for an epidemic of dysentery tried to give the people of that district some plain quinine tablets, but they refused, saying that they used only the Aw Maw medicine. They were ready to buy something that they knew was good rather than take for nothing something of which they were suspicious.

In passing, let me mention the teachability of the Siamese, that if anything, including public health measures, can be demonstrated to be of service, they are quite ready to adopt it. For example, we have practically wiped out small-pox in Siam through vaccination. When the Mission arrived whole villages were wiped out by the scourge of small-pox. Dr. McGilvary began vaccination, but it was impossible to secure vaccine virus sufficient to be of any great service, so that when Dr. McKean arrived he decided that the solution

was to make our own vaccine. Securing a trained laboratory man from the Burmese Government, he established a laboratory for the making of vaccine virus, which for ten years furnished all the vaccine for the Mission and the government, and sent out sometimes as many as 200 vaccinators throughout the north, who practically eliminated small-pox.

Another source of income in sales is from green pills. Realizing that it was easy for an illiterate people to identify things by some significant color or label, he had the ordinary C. C. pills coated green, and these green pills, as they are called, have a tremendous reputation throughout all of North Siam, and we wholesale them by the hundreds of thousands.

The fourth source of income is from gifts. This has been especially serviceable in connection with our building program. We have a plant which would cost approximately \$120,000, of which about \$50,000 came from the U. S. A. In our campaign to raise money for these buildings we received money from Buddhists, Mohammedans, Hindoos, as well as Christians; and all the races in the community—British, French, Siamese, Chinese, Indian, Burmese, etc., contributed. A recent visitor, a physician who had spent much time in China, and who had visited Burma, India, and the Near East, said that he had seen nowhere in Asia such cooperation as we had with our local community. I have mentioned the foreign ward, the gift of British firms. We have a kitchen and dining-room building, the gift of the Chiangmai Church, the largest gift ever made in the history of the Church. We have a ward for Buddhist priests, the gift of a wealthy merchant who is also putting up a maternity ward which is now nearly completed, and in connection with this maternity ward we plan a further community service in the way of a school for midwives. We have less than 400 doctors for ten million people, so that the Siamese mothers are at the mercy of ignorant, superstitious, and dirty midwives; and to correct this condition we are planning a school for midwifery in connection with the new maternity ward. This will require additional support; and in order to make this possible the Viceroy is at present on his own initiative raising an endowment to endow a number of beds in this maternity ward, he himself having pledged the endowment for the first bed.

We have more than half the money in hand already for an administration building, which will be a memorial to the old royal family of Chiangmai. When Dr. McGilvary reached Chiangmai sixty years ago his first converts were killed by the reigning prince; and he plotted to kill Dr. and Mrs. McGilvary. Now his grandson and granddaughter are building a memorial building to the old royal family; and this prince who declared that he would have no Christianity in his dominions will have no other permanent memorial but his name on a brass plate in a Christian hospital.

Gifts for maintenance are much less in evidence, although during

the past year we had ten royal visitors, all of whom made some contribution to the hospital work. The hospital is one of the show places of the city; and we have so succeeded in making the officials feel that it is a community enterprise that they gladly bring all official visitors to see this new hospital. One, perhaps the great reason why we have been able to secure this community cooperation has been the type of service that we have endeavored to give. When the new hospital was opened I had a service with my assistants,—the nurses, orderlies, and even the cooks in the kitchen,—and I told them that we were undertaking what the Mission considered an impossible task, that we had been told that this could not be done, and that the only possibility of doing it was if we were willing to give ourselves without stint in this enterprise. I read them passages from the Scriptures—the first that passage where Christ spoke of the man who had a servant out in the field, and then when he returned asked him to serve him, and then said, “Does he thank that servant,” and added, “Even so say we are unprofitable servants; we have done that which it was our duty to do.” And then that one verse from the Sermon on the Mount, “If a man compel you to go with him a mile go with him twain.” I told them what I firmly believe, that there was no profit for themselves or for the Kingdom of Heaven, or for the Christ whom we serve, if we did only our duty. It is only when we were willing to go that second mile in loving service that profit would begin for him or success for this hospital established in his name. And these splendid young men and women, my helpers in this enterprise, have been doing this in a splendid way.

To illustrate: Recently an old lady came into the hospital who was one of the most unhappy, unpleasant, and unresponsive people whom it has ever been my pleasure to meet. Her son was a graduate of the Bangkok Christian College, had been an evangelist, and was then a student in our Theological Seminary. The only other child, a daughter, was a teacher in one of our Christian girls' schools. Yet this old woman, whose sole support was these two children, was an earnest, confirmed Buddhist, who refused to consider or to listen to any Christian teaching. She came to Chiangmai to keep house for her son, and, being ill, was brought to the hospital. We found that she had a large uterine fibroma, which we persuaded her to have removed. At the time of the operation we discovered the reason for the scowl on her face. The pressure of this tumor on rectum and bladder must have meant a tremendous amount of torture for this woman. The surprising thing was that she had been able to carry on at all. Within a week she was a different person. She met everybody with a smile. She was interested in her neighbors. When a new patient arrived she wanted to know if they were going to have an operation, and showed tremendous interest in all the other patients in the ward. When she left, after a couple of weeks, I asked her what she was going to do, whether she was going to consider Christianity and follow the leadership of her children. She

told me that she had decided to accept Christ. She said, "I never knew what Christianity meant before, but now I have discovered that Christianity means love, and so I am going to be a Christian." And a few weeks ago we had a letter that this old woman had been baptized. She waited until she could go back to her old home town and there be publicly received in the place where she had been known to all her neighbors as a confirmed Buddhist, because she wanted to give her testimony there.

FACTORS IN THE NATIONALIZING OF MEDICINE IN THE FOREIGN FIELD

DR. THEODORE BLISS

THE medical missionary presumably goes to some country other than his own in order to care for the sick and suffering, and so to exemplify Christianity in action that many may be led to find in Christ the Saviour, whom they have been seeking. It is not long, however, before he discovers that there is much more to this job than at first appears. The evangelistic part of his work would itself supply material for much discussion, but that cannot be considered here—not because it is unimportant, but because our attention is now directed to its scientific and medical aspect. And this, whether or not he realizes it, is a task of no little magnitude. It is nothing more nor less than the introduction into that country of the knowledge which modern science has acquired with regard to the causes and prevention and treatment of disease, and the development and organization of a native personnel capable of putting this knowledge into practical use in the care and treatment of the sick, with all that implies. In other words, it means the adoption of medical science by that country,—making it as a member of the family, or, if you will, "nationalizing" it.

UNDESIRABLE NATIONALIZING

The word *nationalize* is not a desirable one to use in this connection because, in one sense, we do not wish to *nationalize* medicine. The term calls to mind "British medicine," "French medicine," "American medicine," or what not, as if each were a separate entity quite shut off from all the rest. As a matter of fact, medicine is not limited to any one country or group of countries. "There is neither East nor West, border, nor breed nor birth" in the warfare waged by the medical professions of all civilized countries against humanity's common enemy, disease. Sir Claude MacDonald once related an incident in point. A British expedition in Egypt had encountered some hot weather and some hot fighting, and the sick and wounded were loaded on barges and sent down the Nile towards the base hospitals. Before they arrived they came upon a French hospital ship, anchored at one of the river ports. When he saw

what had happened, the Frenchman lowered his boats, and brought the wounded and sick aboard, and did all he could to make them comfortable. When the British commander later came aboard to pay his respects, he said to the French officer, "I wish to thank you for your kindness in caring for our wounded nationals!" To which the Frenchman responded with a bow, "Sir, the wounded have no nationality." This, I think, most aptly expresses the attitude of the physician and anything which would be likely to divide that great army of workers into mutually exclusive groups should be discouraged. The scientific basis for the modern treatment of the sick is beyond the bounds of nationality; and one great force making for the realization of the brotherhood of the nations would be destroyed if we succeed in effecting that kind of "nationalization" of medicine.

DESIRABLE NATURALIZATION

What we have in mind is rather the naturalization of medicine, and this involves, when completed, the acceptance by the native medical profession of the responsibility for all the various lines of activity in the maintenance and restoration of the people's health. This would include the Public Health service, the licensing and regulation of the medical practitioners, the supervision and maintenance of hospitals (including special hospitals for the insane, the tuberculous, the lepers, etc.), and all matters of medical education and training of dentists, pharmacists, nurses, and attendants. This is a large order, and the more one meditates upon the details involved, the larger it looms. The complete development will even include the manufacture and sale of such hospital and sick-room supplies and the gauze and cotton used in surgical dressings, surgical instruments and appliances, operating room furniture and the like, not to mention the manufacture and distribution of medicines by the native pharmacists! It recalls the parable of the stone thrown into the ocean, the waves from which roll in ever widening circles to the farthest shore! Fortunately for us, our chief concern is throwing in the stone. But although our part may seem small, yet even the throwing of the stone requires a certain amount of attention.

METHOD

Now comes the question, How does all this affect my work as a medical missionary? What can I do to bring about this desirable result?

It seems to me that the crux of the matter is the *development of the native medical profession*; and, at the same time, there must be—to borrow the business man's term—a *demand for the services he can render*. Please do not confuse the term "*demand*" with "*need*." I dare say there are among those present *some* who *need* the services of a dentist who are not *demanding* them. There is no question

about the need for the services of the skilled physician in countries like China, for example. But often the people do not know that relief is possible, or where to obtain it. Fortunately this problem is not usually a serious one. Each patient treated at the mission hospital, or by the skilled practitioner, becomes an educator. He tells all and sundry about his experience. "Speaking of operations" gives him quite as great a thrill as it gives our nearer neighbors. The difficulty is usually the other way about. There are not enough doctors or hospitals where adequate treatment can be given. And since the development of a medical profession takes time, there seems to be little likelihood of serious trouble from this particular quarter.

DEVELOPING A NATIVE MEDICAL PROFESSION

Developing a native profession presupposes that you have already something started. I remember when I was a student hearing a missionary returned from Africa tell how he had successfully performed a major surgical operation with the shade of a large tree for operating room; a couple of packing-cases for operating table; and a clerical colleague for assistant. Sometimes "in the beginning" it is like that. Time is required. Gradually patients become more numerous. Native helpers are added and trained. Beds are provided and, ere long, a hospital has grown up. Among the native staff some show promise and are given instruction; at first, by the doctor on the field, and later some especially bright student is sent to a medical school. The hospital staff is enlarged, to become finally a faculty of medicine, and in time the students who have been trained there receive diplomas and are ready to act as assistants in a hospital under supervision of some foreign physician, i.e., the medical missionary, and here is his opportunity. How shall he proceed?

Unfortunately it is not possible to do more than indicate some general principles, leaving the details to be filled in according to the individual requirements. Confucius said, "If I show a pupil one corner of a table, he should find the other three himself."

Of course one should study the neophyte closely to find out exactly his capabilities and limitations, whether he needs restraint or encouragement, tactful coaching such as a more experienced physician can give, and then, remembering that one cannot learn to do anything except by doing it, give him responsibility, as much and as rapidly as he can show himself capable of bearing it. This is, I think, a place where mistakes may occur. It is difficult to avoid being either too lax or too exacting. The former will make for carelessness, and the latter will paralyze initiative by not allowing it sufficient healthy exercise. The aim is to train up the student into a colleague. The process will certainly take time, but it also requires time to grow oak trees. And time is one thing for which there is no substitute. In the end, we are aiming at cooperation.

COOPERATION WITH THE NATIVE MEDICAL PROFESSION

Having developed some native medical practitioners with whom to cooperate, the next step is to proceed to cooperate. And this brings us again to the question of naturalizing medicine, or of adapting the principles of medical science to meet the needs of a definite situation. To do this successfully requires the thorough understanding of medicine, and of the details of the particular problem in hand, including the native viewpoint.

When I first arrived in the mission field, this problem was encountered almost immediately. The house in Tokyo had been most thoughtfully provided with a complete set of servants to run it. Within a few days, one of the maids began to limp, and I found that she had an abscess in the foot, such as used to be called a "stone bruise." It had to be opened, so she entered the hospital, where I later on saw her. She was very unhappy, because she was in a hospital bed with a spring that yielded to the least movement, "just like an earthquake," she said. Having always slept on the mat-covered floor of her Japanese home, she was afraid she would fall off the narrow bed. I then learned that it was quite the thing for patients to fall out of bed when they first entered, and that the night nurses had to exercise special vigilance to prevent injuries. Naturally the question arose, Why use foreign hospital beds? Why not allow the patients to sleep as they are accustomed? Is the foreign style bed really a necessary part of the treatment, or just a foreign custom without any real justification, except we are in the habit of using them?

I believe beds are still used, not only in mission hospitals but in the Japanese hospitals, also. If so, it would indicate that it has been found that the patients can be better cared for in that way than when parked on the floor. But the lesson is plain. We should be careful not to confuse what is essential, and based upon sound principles, with what is merely our own peculiar national habit or custom.

It is not always easy to make this distinction. When we do things, as we say, in the natural way, we may find that our friends of another nation do it with equal "naturalness" in quite a different fashion. We have both simply learned our own native ways without conscious effort. We place a bookmark at the top of the page; our Japanese friends place it at the bottom. When it comes to the management of a hospital, there are a host of details where the foreign way and the native way differ. The problem is how to harmonize the two in such a way that the native patient may be made comfortable and at ease without thereby sacrificing anything which will accelerate his recovery. To do this successfully requires a thorough knowledge of the principles of treatment, and also a thorough understanding of the native mind and its peculiar likes and dislikes, its beliefs and prejudices.

This is the point where we need the help our native colleagues can

give. The growing native medical and nursing professions will, of course, eventually take up the complete responsibility and carry on this process of fitting scientific principles to meet the native needs. But there is at first a period during which they have fully mastered these principles and yet have not acquired the maturity of judgment which they will later have. Then it is that there is need for the control to be still maintained by the foreign physician. If he is the right type of man for the work, he will not be likely to go far wrong in his decisions.

PROGRAM

The general plan will then be a gradual shifting of the responsibility from the foreigner to the native. We may distinguish at least four stages, although in practice they will merge into one another without necessarily a sharp division.

First: The foreign physician is administrator as well, and is in complete control.

Second: The foreigner has associated with him native colleagues with whom he shares the responsibility.

Third: Responsibility has been assumed by a native administrator or staff with a foreign counselor or advisory board.

Fourth: Complete native responsibility in all matters.

This is the road by which Japan reached her present position, and much can be learned from a study of the experience of that country. In other countries, the conditions differ, and the problems are differently expressed, and the stage of progress varies. Yet it seems to me that the general plan in all cases must be the same, although the details will be different. In some countries, where caste exists, or where there are religious or superstitious prejudices which conflict with certain sanitary measures for the control of disease, no compromise is possible, and there will be a renewal of the age-old conflict between truth and error. Much can be done by patience and tact even there to minimize the "shock of battle," and to bring ultimate success.

FACTORS IN THE COMPLETE DEVOLUTION OF MEDICAL WORK

Summary of Address by DR. H. H. WEIR

Medical Secretary, S. P. G., England

There are four factors in the devolution of medical work: (1) Ownership, (2) support, (3) control, (4) the staffing and running of the hospital. The fourth factor is the most real problem and the future does not seem at all clear on this point. On the one hand, the ideal in a hospital is certainly not one of the material benefit to be afforded to the Christian churches, nor, on the other hand, is it to envisage it

as a pure philanthropy; it ought to do more for the Christian community than a state hospital would. The Christian church in foreign lands ought to constantly reveal God to these people, and the Christian hospital should be a means to that end. With these conditions in mind the question comes ultimately to one of personnel. The British Advisory Board on Medical Missions wrote to the mission boards asking them what kind of doctors other than foreign missionaries were being used in various lands. The replies received indicate a great lack of knowledge on this point. They then drew up a short questionnaire and asked the boards to send it to their stations, both to doctors and to other missionaries who were competent to give an opinion. There were forty-five responses from nine different Boards and these can be grouped in four sections:

(a) The Near East, including Egypt	5	answers	from	2	societies
(b) Africa.....	4	"	"	3	"
(c) India.....	12	"	"	5	"
(d) China.....	24	"	"	6	"

The questions asked are as follows:

1 and 2. Present methods of appointment of doctors with local diplomas; by whom appointed and relation to local church and home board.

There are various methods of appointment but little relation either to the local church or the home board, and little or no dissatisfaction is expressed with the methods in vogue.

3. Do they receive any special training as missionaries?

Practically none; not much enthusiasm is displayed for giving them any.

4. What is the status in local church and mission?

It is that which their education and Christian standing would naturally secure for them as ordinary members of the church and helpers of the mission.

5. Remuneration: Principle of a relation to that of foreign doctors and clergy and native workers?

There is no definite principle. Salaries range from something considerably more than native clergy receive up to market value, which is sometimes as high as the foreign doctors receive, and relatively higher. In one case where private practice is allowed the total income is double that of the foreign doctor. Occasionally native workers are not Christians.

It will have to be acknowledged that at the present in most cases the replies indicate that nearly all the native doctors are considered as assistants only. Few of the answers show any idea of the development of future colleagues except in China, very few seem to be looking toward future devolution of medical work to the native church, and fewer still are planning to prepare for it.

The following is a summary of the conclusions derived from the various answers:

Moslem Lands.—The employment of doctors with local diplomas is on a commercial basis. The attempt to secure the services of the best Christians available appears to be the utmost possible.

Methods of Appointment vary much. Usually the appointment is in the hands of the missionary concerned. In a few cases, where church organization is more complete, there are medical committees—sub-committees of the governing body of the area—which deal with such questions. Several answers express a desire for this method.

Relations to Local Church or Home Board.—As a rule such doctors have no definite relation either to the local church or to the home board, beyond the fact that they are generally members of the church and often prominent ones. In a very few cases they are reckoned as missionaries on the list of the home board, which then approves their appointment. No views are expressed as to the desirability of the doctors having any more definite relation to either.

Special Training as Missionaries.—In almost all cases no such training is attempted. Many express the view that it is neither desirable nor possible. A few consider that it can be and is given, or should be given. Some lay emphasis on the need of efforts being made in medical schools to stimulate a desire for spiritual work, to encourage Bible study and devotional habits, and to lay foundations which will equip the doctor to be a real missionary. Others consider the most important matter the tone of the hospital at which the doctor is trained and does the first few years of qualified life, and above all the example and influence of the missionary in charge of it. The real medical missionary spirit is caught not trained.

Remuneration.—The utmost variety is found, hardly any two answers being the same. Some frankly admit that they pay as little as they can get a suitable doctor to take, often more than their own salaries. In almost all cases the pay is more than that of the native clergy. There is no real principle put forward as the basis of payment in any case and the idea that there might be such a principle hardly seems to have occurred to anyone. This question evidently needs to be put forward for careful consideration in almost every case.

Status.—Some urge that well qualified doctors should have the same status as foreign doctors. Others urge the need of engaging only those who have a real vocation.

Suggestions.—Quite apart from any desire which there may be for the transfer of authority to the local churches, it is evident that it will be many years before mission hospitals could be so transferred. Further, little thought, except in China, has been given to the subject as it concerns medical missions, and still less has been done to prepare for it. It would be well that all missions should give thought to this question and endeavor to outline a policy which

will lead to the possibility of a transfer when the need and occasion arise.

It would seem desirable that medical missionaries in general should be seeking for qualified assistants who will in due course develop into true colleagues and planning to help them in that development.

Much thought should be given to the principles of remuneration, and efforts should be made to work out a policy which may be applied as widely as possible. Sacrifice should be asked for, but salaries should be really adequate.

Every effort should be made to help medical students in their spiritual life and to encourage them in definite work for the church while still students.

THE IMPORTANCE OF WELL-BALANCED DIETS IN THE PREVENTION OF DISEASE

W. E. DEEKS, M.D.

Medical Department, United Fruit Co.

THE natural longevity of man is directly influenced by several factors. Among the more important of these may be mentioned inheritance, environment, occupation and nutrition. Man has succeeded in his "Struggle for Existence" because of the development of agents of defense, external and internal. By means of his intelligence, he has been able to devise methods of defense and offense against external enemies. As the gift of his inheritance, he possesses internal defensive agents which are shared by the whole animal kingdom. These are many and elusive, exist in his tissues, and are both cellular and humoral in character. By these means, man has waged a defensive and offensive battle against his enemies including infectious diseases; many individuals succumbing, but, *homo sapiens*, as a race, surviving. To this end, environment, hygienic and climatic, is a contributing factor, as well as occupation—many forms of which predispose to disease. Of all the factors concerned in the maintenance of health and the longevity of man, nutrition undoubtedly plays the most important role, as it concerns all individuals and is daily essential to existence.

It has been definitely determined that an inadequate diet, deficient in quantity or quality, may not prove permanently deleterious over a small percentage of the life-span of an individual, whereas if this period be prolonged, serious results follow, either by lowering the resistance of the defensive agents of the body in their struggle against the invasion of infectious organisms, or by predisposing to the deterioration of the tissues and their functions, thus resulting in organic degeneration, early senility and premature death. Unfortunately, this progressive degeneration is insidious, and frequently the damage

is irreparably done before symptoms are manifested. The importance of adequate nutrition, therefore, in the processes of growth, tissue repair, and in the maintenance of health, must be stressed if a prolonged and healthy existence is to be realized.

A general survey of the health conditions of the civilized races at the present time discloses that there is an appalling percentage of sickness and suffering, and though we have learned the causes and methods of control of many diseases which scourged the world in the past, such as plague, cholera, smallpox, yellow fever, malaria, typhoid fever, hookworm disease, tuberculosis, diphtheria, pellagra, scurvy, rickets, etc., yet premature decay and loss of teeth are well nigh universal, and there is a constantly mounting percentage of deaths from arterial degenerations, heart and kidney diseases, cancer, etc.

The increasing percentage of deaths from certain forms of disease among civilized races is not the outcome of poverty or of indifferent sanitation as, at the present time, individuals as a whole are probably better housed, better clothed, more cleanly in their habits, and more abundantly provided with foodstuffs, than at any previous period of history.

As a result of clinical experience, we seem justified in stating that the fundamental cause of many of the ills from which humanity suffers rests mainly on the deficiencies of essential factors in the otherwise abundant food supply.

Primitive people live for the most part in scattered small communities, and their foodstuffs are locally produced and primitively prepared. When these become scarce, they migrate to localities where fresh supplies are obtainable.

This nomadic method of existence is not possible with modern centralized communities, as habitations are permanently located and food supplies must be brought to them. This has necessitated the development of transportation facilities—which have become such important factors in the life of all civilized nations—and of methods of preservation of foodstuffs, many classes of which in the natural state cannot be transported without suffering deterioration, nor indefinitely kept in storage without becoming worthless. Furthermore, civilized people prefer foods which in appearance and taste appeal to their aesthetic sense. To meet these demands of civilized communities, producers, manufacturers and shippers have evolved methods of refinement in the preparation and preservation of foodstuffs and of their transportation which, in many instances, have resulted in depriving them of essential elements necessary to normal development and the maintenance of health.

These facts have been appreciated only in recent years through biological investigations, which have been pursued by a large number of scientific observers. An enormous amount of new data has accumulated which is not readily accessible to those interested in health problems from the standpoint of nutrition; therefore a brief

reference to some of the more important recent discoveries seems desirable.

This leads us to the consideration of what constitutes a nutritious, well-balanced diet. For many years we have known a great deal about the chemical composition of foods as determined by analyses, which necessitated incineration, but it is less than three decades since biological studies began on foodstuffs, based on animal feeding experiments. These studies have revealed an enormous amount of information, repeatedly confirmed by independent workers, which has necessitated the revamping of our old practices, which were based on the analyses of dead foods.

A brief up-to-date summary of our present knowledge of food values seems in order, for it is by the practical application in our everyday life of the principles involved in the recent discoveries that we may hope to prevent early tissue degeneration and bacterial invasion.

Food requirements.—Food is required for the following purposes: Growth, restoration of tissue lost through wear and tear, and production of heat and energy (muscular and nervous). In health man maintains a constant temperature, notwithstanding the continuous dissipation of heat from the surface of the body, lungs, and kidneys, which is increased by muscular work and exercise. The source of heat supply is by means of the combustion of food derivatives, a process of oxidation through the union of oxygen with the ultimate products of digested food. Oxygen is furnished by the lungs, and carried by the red blood cells to all other cells of the body. The oxidation or combustion of food in the cells is similar to the combustion of coal or wood to furnish heat. The fuel requirements of the body vary according to the age, temperament, size, and build of the individual; the temperature of the environment; and the amount of energy expended in work. In general terms it may be stated that a healthy man weighing 150 pounds, in a temperate climate, and in the performance of ordinary work, requires daily food equivalent to 3,000 calories.

We obtain our food from the animal and plant kingdoms, and also from the inorganic world. Plants are able to synthesize or build up complex substances such as proteins, fats, starches, sugars, and vitamins, from water and mineral elements in the soil and air with the aid of heat, light, and electric radiation from the sun; but in order to maintain life, animals require these complex foods already formed. It has been definitely ascertained that in order to secure satisfactory growth and to maintain health, the food intake of animals, including man, in addition to oxygen from the air and water, must consist of the following food factors, derived from either plants or animals: (a) proteins; (b) hydrocarbons or fats; (c) carbohydrates or starches, sugars and cellulose; (d) certain mineral salts; (e) at least six vitamins, which have been designated A, B, C, D, E, and F. In order to make foodstuffs available for assimilation, they must be digested and

this necessitates their conversion into simplified and diffusible substances, which can be absorbed into the blood or lymph channels.

Proteins.—Proteins constitute the nitrogenous elements of animal and vegetable tissues and are absolutely necessary in some form as food for the animal organism. Chemically they consist of amino acids, eighteen of which are known, bound together in various proportions by chemical linkage; and protein digestion in the alimentary tract consists in the maceration and hydrolyzing of these combinations into their respective amino acids. When these are absorbed into the circulation, some of them are reshuffled and, in combination with the alkaline inorganic salts and water, are resynthesized to build the respective tissues necessary in new growth, and to replace those tissues destroyed by wear and tear. From the greater part of the amino acids the nitrogen radicle is split off and the rest is utilized for heat and energy after the manner of fats and carbohydrates.

Fats or hydrocarbons.—Fats are derived from animal and plant sources and are absolutely necessary in a satisfactory diet, not only because of their high energy-producing value but also because of their intimate association with Vitamins A and D. Fats should not be consumed in excess of from three to four ounces daily. The amount consumed will depend upon the character of the fats, as some are more digestible than others; the amount of energy expended; and the temperature of the environment in which the individual lives.

Fats can be utilized only in combination with carbohydrates, and unless these are present in sufficient amounts and normally metabolized in the tissues, acetoneemia develops—a condition frequently encountered, particularly in diabetes when insulin deficiencies prevent carbohydrate utilization.

Carbohydrates.—The carbohydrates (sugar, starches, and cellulose) in gross weight represent about five-sevenths of the food in normal diets, or over three-fifths of its caloric value. They are obtained from different sources which have different food values.

Cereal grains.—Cereal grains, in addition to their starch content, are also a valuable source of protein, of which they contain from 10 to 16 per cent. Their use as food dates back to the earliest historical records. Primitive races pounded and parched them and the whole grain was consumed. In consequence the complete natural supply of vitamins and mineral salts was utilized. Furthermore, the mastication of hard grains assisted in the maintenance of a high-resisting power on the part of the teeth and alveolar structures. About fifty years ago the milling processes of preparing cereal grains for consumption were introduced. These removed the germ and outer bran layer which contain the vitamins and most of the mineral salts. Therefore the refined products, though improved in keeping qualities, appearance, and taste over the more primitive products, are not only deprived of their vitamin values, but also of most of their mineral elements, both of which are essential in an adequate diet. We are all aware how extensively refined cereal products enter into the diets

of civilized races in the form of bread, cake, pastries, macaroni, vermicelli, spaghetti, polished rice, corn flour, breakfast cereals, etc. They are the cheapest foods available, as more heat and energy per unit of cost can be obtained from them than from any other source of nourishment. The cereal grains, and their derivatives, as well as all flesh food, have an acid ash when metabolized in the body, and as the blood is normally slightly alkaline, other sources of food must be ingested. Abundant sources of starch, with an alkaline ash, are obtainable from the tubers and fleshy roots, and these should be utilized to a greater extent than they now are because, in addition to their valuable starch and alkaline mineral contents, they are excellent sources of vitamins, and on account of their rich cellulose contents they furnish bulk, which is necessary to good digestion.

Refined sugars.—Refined sugars, which are so generously consumed in a variety of forms, have no mineral salts or vitamins, and are prone to fermentation in the mouth and stomach, thus producing irritable organic acids which favor the erosion of teeth and the irritation of the gums, precursors of bacterial invasion. The annual consumption of sugar has increased in this country to over 100 pounds per capita. The total consumption of the world in 1870 was 2,750,000 tons; in 1890, 5,360,000 tons; in 1900, 8,647,000 tons; in 1910, 14,914,000 tons; in 1914, 18,733,000 tons; and the estimated consumption for this year is about 24,000,000 tons. *Pari passu* with this increased consumption, statistics show that there is a corresponding increase in many pathological conditions.

Mineral elements.—The various tissues of the body are built up from fifteen mineral elements; namely, oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, potassium, sulphur, sodium, chlorine, magnesium, iron, iodine, and traces of fluorine and silicon. In some form of combination all of these elements are necessary to the proper functioning of the cells of the body. Complete deprivation of these causes death within a month. Each element serves a particular purpose. Calcium, phosphorus, and magnesium are the chief constituents of bones and teeth. Calcium is also necessary to the clotting of blood, the curdling of milk, the digestion of fats, and the muscular contractions of the heart. Potassium and phosphorus are important constituents of muscles; potassium of all tissues; and iron of the hemoglobin of the blood. Sodium in combination, as phosphates, carbonates, bicarbonates, etc., preserves the alkalinity of the blood. Sulphur is an important element in all protein. Chlorine is necessary in the formation of hydrochloric acid for protein digestion in the stomach, where it also inhibits the action of fermentative and other bacteria. Iodine is a constituent of the thyroid gland, necessary to the formation of its hormone (thyroxin). Milled cereal grains and tubers are deficient in sodium, phosphorus, calcium, and chlorine; and flesh foods in sodium, calcium, and chlorine. In consequence, both of these classes of foods in an ade-

quate diet must be supplemented by foods rich in the mineral elements.

Nature is adaptable to urgent needs and when diets are deficient in contents necessary to the existence of the organism as a whole, or in part, she draws on her reserves; and in the case of calcium and phosphorus, there are the bones and teeth. If you feed carnivorous animals on muscle meats only and do not include bone, the bone structures of the animal are drawn on to furnish the deficiencies in the diet. This is easily demonstrated by X-ray examination. Moreover, it is a long-standing observation among medical men that during pregnancy and lactation, the teeth of the mother suffer even to the extent of the loss of some of them, owing to the tremendous demand on the mother for calcium to build the bone structures of the developing infant; also, large quantities of this element are necessary to produce milk as it is rich in calcium. During these periods the mother should be supplied with food rich in calcium, or her own bone tissues and teeth, as well as those of the growing fetus, will suffer deterioration.

Vitamins.—During the last twenty years we have learned much about vitamins, and six of them have been identified through the experimental feeding of animals. As a result of recent investigations, Vitamin B seems to have two functions—antineuritic and antipellagrous. The vitamins have not been chemically isolated, but we know them by their effects on vital activities. An adequate diet necessitates definite quantities of all of them. As McCarrison states—"Without their presence, food, in a sense, is dead." Man and most other animals cannot synthesize them, and they must be taken in food, from either animal or vegetable sources. They are powerfully active substances in the processes of growth and the maintenance of health. They stimulate metabolic activity and are essential to the normal chemical changes that take place in the body tissues. In other words, they may be said to vitalize cell life in the body and control the metabolic processes, as well as the physiological functions of the various organs.

Vitamin A deficiencies in the food-intake lead to the retardation of growth in the young, a lowering of the resistance to infection of the epidermal structures of the eyes, oral cavities and its glands, skin and its glands, sinuses, bladder, alveoli of the lungs, stomach (part); and its deficiency plays an important role in the formation of calculi in the bladder, kidneys, and gall-bladder. All structures of ectodermic origin, and these include the enamel of the teeth, seem to suffer.

Vitamin B deficiencies in food cause loss of appetite, atrophy of the intestines, liver, heart, pancreas, genital and endocrine or ductless glands, and are responsible for the well known syndromes of beri-beri and pellagra.

Vitamin C deficiencies are responsible for the development of scurvy, but their effects on the dental structures are most striking

and important. Dr. Percy Howe, of Harvard, and others have investigated these by animal experimentation and some of their findings are briefly referred to:

One of the first observed manifestations is a shrinkage of the pulp from the dentine, and in the separated space fluid collects. As the odontoblast layer of the cells covering the pulp becomes separated from the dentine, into the canals of which the branches extend, naturally the organic matrix in which the mineral salts are imbedded is deprived of its nourishment and becomes liquified, thus liberating the mineral salts which are reabsorbed into the blood stream. Other associated tooth structures—enamel, cementum, and alveolar processes—also suffer. Recession of the gums follows, and the teeth soften, loosen, and may fall out. Because of the resulting lowered resistance of the involved tissues, bacterial invasion of the roots and gums takes place. Howe believes that the organic matrix of the enamel is supplied directly with nutritive elements through the underlying dentinal structures, and he has in animal feeding experiments demonstrated that the enamel suffers in unbalanced diets along with the other tooth structures. In other words, the resistance to decay of the teeth is largely from within and not from local oral conditions.

Diets deficient in Vitamin C also interfere with the development of the facial bones and dental arches, leading to malocclusion, and crowded and crooked teeth. These defects may be determined prenatally if the mother's diet is deficient in this vitamin.

Vitamin D deficiencies, in conjunction with an unfavorable relation between the calcium and phosphorus elements of foods and the absence of sunlight, lead to rickets, a disease which is associated with defective bone formation, muscular relaxation, digestive disturbances, nervous irritability, and skeletal deformities. Recent work has demonstrated that one ten-millionth of a gram of ergosterol (a plant derivative) which has been subjected to ultra-violet radiation will prevent rickets in a rat; and a daily dose of two milligrams will cure human rickets.

Vitamin E deficiencies lead to sterility; and Vitamin F deficiencies to defective lactation.

Sources of vitamins.—They are found in the following edible foods, in quantities sufficient for protection:

Animal tissues.—In liver, kidneys, pancreas, glandular fat organs, eggs, and milk and its products; and also the intestinal viscera, which are not generally eaten by the civilized races. They are practically absent from the muscle meats, which are generally utilized as foods.

Cod-liver oil, egg yolks, and liver tissues are particularly rich in Vitamin A. Recent work would seem to prove that the liver fats of sheep, calf, and ox, are ten times as rich in Vitamin A as cod-liver oil; and that the liver oils of salmon, halibut, and some fowls (goose and grouse) are one hundred times as rich in Vitamin A as cod-liver

oil. This may be one of the many reasons why liver is so strongly indicated in the treatment of pernicious anemia.

Plant tissues.—(A) Cereals. They are present only in the germ and outer layer of cereal grains, and these are removed in the milling process. They are, consequently, absent from white flour and all its derivatives, such as bread, cake, macaroni, spaghetti; from polished rice; refined corn flour; and also from almost all forms of breakfast cereals.

(B) Legumes (dried peas, beans, and lentils). They are present and generally distributed throughout the seed, but in insufficient quantities for protection (particularly Vitamins A and C), unless sprouted and consumed in this state.

(C) Tubers, and root vegetables, contain generally sufficient amounts for protection. Raw carrots are rich in Vitamin C. White potatoes have no Vitamin A.

(D) Leafy green vegetables are generously supplied with almost all vitamins, in amounts ample for protection.

(E) Fruits and nuts are generously provided with A, B, and C.

We must also consider the role played by bacteria, of which several hundred species have been identified. Some are pathogenic or disease-producing, and others are not. The latter group may be subdivided into those that cause fermentation, those causing decay in organic matter, and those that are color producing.

The human body may be likened to a hollow tube. The skin represents the outer surface while the alimentary canal is the hollow; and between these is the body wall, consisting of the frame work, muscles, circulatory system, etc. Millions of bacteria, disease-producing and others, are found on the surface of the body; and they also inhabit the alimentary tract. Under normal conditions they do not enter the structural tissues of the body wall. When they do, several species cause diseases which may prove fatal. They are prevented from entering the tissue structures by the defensive agents of the body, which exist in the cells and body fluids. When the defensive agents are in a healthy condition and normally functioning, the defense against bacterial invasion is at its maximum. If, however, the defensive powers and activities are lowered from any cause—malnutrition, excessive cold or heat, or toxins—bacterial invasion is prone to occur. Some forms of pathogenic bacteria do invade the tissues; but the cells and body fluids react, and produce anti-bodies which neutralize the toxins and enable the defensive agents to destroy them. Immunity, temporary or permanent, results. If the battle waged by the defensive agents of the body against the invading bacteria is a losing one, the victim dies.

Among symptoms, symptom-complexes, and organic diseases which necessitate careful investigation in regard to the quantity and nature of the carbohydrate content ingested may be mentioned: Periodical headaches including migraine, stomatitis, chronic pharyngitis, dental decay, spongy bleeding gums, focal infections, flatulent

and acid dyspepsia, gastric ulcer, appendicitis, constipation, diarrhoea, skin manifestations, such as furunculosis, eczema, acne, psoriasis, and alopecia of certain types; rheumatic phenomena, including neuritis, lumbago, torticollis, dysmenorrhea, arthritis, endocarditis, etc.; other conditions of undetermined etiology may be mentioned, such as the development of gall, kidney and bladder calculi, arteriosclerosis, chronic interstitial nephritis, retino-choroiditis, ulcerative keratitis, etc.

In children, the symptoms of those using excessive amounts of sweet and starchy food are characteristic: Fickle appetites, irritability, restlessness, lustreless hair, enuresis, recurring bronchitis, hypertrophic tonsillitis, eczema, endocarditis, etc.

In adults the excessive consumption of carbohydrate foods can generally be determined from the dietetic history and subjective symptoms, followed by a careful physical examination. Under such conditions, an examination of the oral cavity will show invariably a chronic pharyngitis, which is probably a result of regurgitation of stomach fermentative products. Dental decay, at times infected roots, and spongy gums subject to bleeding, are generally present. The teeth often loosen and fall out, or have to be removed. With the excessive consumption of starchy foods, the tongue is prone to be furred and flabby; or, in the sugar types, red and irritated. The tonsils are generally inflamed and frequently infected. In the stomach the symptoms of the excessive starches take the form of flatulence. There are gas eructations, frequently voluminous and associated with gastric and cardiac distress. The appetite is dulled, but when food is taken more is consumed than the appetite seemed to warrant. In the sugar types, there is recurring hunger, with appetite easily satisfied, heart burn, gnawing pains, efforts at belching, but with little gas eructated. The symptoms of these two conditions may be combined and merge gradually into each other, depending upon the proportion of the respective foods consumed. It is in these cases that we meet with gastric and duodenal ulcers. In these patients bacteria from infected foci in the teeth and tonsils may be a contributory factor. In the intestinal tract, there may be flatulence associated with persistent or recurrent attacks of diarrhoea. Pruritus ani is not uncommon.

It is not claimed that the excessive use of carbohydrates and the absorption of the fermentative products are the only factors involved in the above-mentioned conditions. When people consume an excessive quantity of acid ash-producing foods, like meats and the cereal derivatives, which are generally devoid of vitamins and deficient in inorganic salts, they are taking insufficient amounts of the foods belonging to the group of green vegetables and fresh fruits, which are the main sources of vitamins and alkaline inorganic salts. The inadequacy of vitamins, as well as an improper relationship or quantity of inorganic salts, undoubtedly plays important roles in the production of morbid conditions, in predisposing to either acute in-

fections or organic tissue degenerations. However, the consumption of excessive amounts of the fermentable sweet and starchy foods is an important dietetic error that has not been sufficiently stressed. Though dietetic errors may be indulged with impunity over certain limited periods of time, sooner or later morbid processes insidiously ensue. Recurring headaches, premature tooth decay, skin eruptions, and digestive disturbances of all kinds should be warnings to an individual that the food he is in the habit of ingesting is not being properly metabolized, and steps should be taken to balance his diet, restricting it to these quantities and combinations of foods or classes of foods which he can handle with impunity.

SUMMARY

A great many pathological conditions, local and systemic, are directly traceable to the following factors in our food intake:

1. A deficiency of vitamins.
2. A deficiency of inorganic salts, particularly those that are alkaline in character.

These deficiencies naturally follow when there is an excessive consumption of milled cereals and refined sugars. Furthermore, when there is an inadequate intake of essential food factors, the defensive agents of the body and the tissues have a lowered resistance against bacterial invasion.

The prevention of a large number of morbid and pathological conditions necessitates a well-balanced food intake, complete in all the essential food factors. These can be obtained from the following sources:

(a) Animal-derived flesh foods, including poultry and fish; eggs; milk and its derivatives, cheese and butter. The liver, kidneys, and pancreas of animals are particularly valuable, because of the character of their proteins and their rich vitamin contents. Milk and cheese are also of great value because they are richer in calcium than any other known foods.

(b) Animal fats, in the form of butter, bacon, etc., can be utilized to the extent of, and not exceed, three ounces daily; but these may be replaced in part by vegetable oils which have similar caloric values, though they are deficient in vitamins.

(c) The refined cereal-derived foods must be restricted to from three to four ounces daily.

(d) All refined sugars, in food, confectionery, and drinks, should be avoided, or used in the greatest moderation.

(e) The bulk of the carbohydrate intake should be in the form of potatoes (Irish and sweet); fleshy roots (carrots, beets, onions, parsnips, etc.); and legumes (peas, beans and lentils). Dried legumes have also a valuable protein content.

(f) There must be a generous intake of growing shoots, green beans and peas, beet and turnip tops, spinach; leafy green vegetables

(cooked and raw), cabbage, cauliflower, Brussels sprouts, broccoli, celery, lettuce, endive, etc.; the fruit of the vine (tomatoes, squash, pumpkins, melon, etc.); and fresh and sun-dried fruits and nuts of all kinds.

It should be remembered that in properly-canned vegetables the vitamins are better preserved than when kept in cold storage.

Groups (e) and (f) are alkaline ash foods.

The last group of foods (f), with the exception of nuts, has very little heat and energy-producing value; but they are rich in alkaline inorganic salts, necessary to tissue building, and are abundantly supplied with vitamins, necessary to all the metabolic activities and organic functioning of the body. They also furnish bulk through their high cellulose and water contents, thus favoring intestinal peristalsis and elimination. Cellulose is acted upon in the intestines by fermentative bacteria, and these inhibit the putrefactive bacteria and their toxic products.

The author refers his readers to the following publications for more detailed information:

- Tice: Practice of Medicine. W. F. Prior & Co.
 Hutchison, Robert: Food and Dietetics. William Wood & Co.
 Bayliss, W. M.: Principles of General Physiology. Longmans & Co.
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 McCollum and Simmonds: The Newer Knowledge of Nutrition. The Macmillan Company.
 Sherman, Henry C.: Chemistry of Food and Nutrition. The Macmillan Company.
 Eddy, Walter H.: The Vitamin Manual. The Williams & Wilkins Co.
 Greene, Charles Wilson: Kirkes' Handbook of Physiology. William Wood & Co.
 Howe, Percy: The Dental Digest. The Dentists' Supply Company of New York.
 Deeks, W. E.: Diet and Disease. The American Journal of Tropical Medicine.

A HEALTH PROGRAM FOR MISSION SCHOOLS

FRED J. WAMPLER, M.D.

With the permission of the program committee I shall change the subject of this paper to take in more than that which is included in the subject on the printed program. In addition to Health Education in Mission Schools, I want to discuss the practice of health in the schools, thus the subject, "A Health Program for Mission Schools."

I shall be compelled to draw largely from the report of the Conference on School Health, held in Shanghai, December 1-3, 1924, from "A Public Health Education Program for China" by W. W. Peter, and from reports of different members of the Council on Health Education.

Please pardon a digression.

Ten years ago in the shadow of the Great Wall a small group of medical missionaries, assisted by some of their evangelistic and educational colleagues, were waging a winning fight against the ad-

vance of the penumonic plague. Homes, clans and whole villages were sometimes left lifeless. In some places a third of the population was already wiped out. In other places 10 to 20 per cent. were sick. Those left living in the infected homes and villages were terror-stricken.

To come to a village once prosperous and self-contained and find the people in panic through fear of the terrible plague; to take hold of the situation with the cooperation of the officials and citizens, and in seven days' time be able to declare the village free from the pest, was enough to open one's eyes. As I rode from village to village, helping to direct the local quarantine and relief over that North Shansi plateau, I began to reason within myself that, after all, in a less intense way, was not the same unnecessary loss of life going on every day where communicable and preventable diseases were concerned?

The medical profession has the knowledge to either control or decidedly lessen the ravages of disease. The people either do not have this knowledge or are not organized to apply it. From that day to this, I have given less and less of my time to work within the hospital and more and more to an ever widening area about the hospital. All the medical men from the province of Shansi who were in that group fighting the pneumonic plague and who are now in active service are paying much attention to preventive medicine and school health work.

Back to the subject:

The Importance of Mission Schools in China.—"Mission schools represent 18 per cent of the total middle school and higher educational enrollment in China. The actual influence, however, is much greater than this, for the standards of modern education have been set by mission schools."

Need for Health Program.—That health education and health practice are needed in mission schools goes without saying. Send a man through grammar school, high school and college largely at church expense, and then have him break down in health, just as he should begin to serve his fellows, is an economic absurdity. This result, however, is all too frequent. Out of six men my own mission aided in medical education over a period of about ten years, one broke down with tuberculosis just as he was finishing his course, and another for this same cause had to leave school at the end of his sophomore year. We have had similar experiences with men in other departments. This experience is not exceptional. Most missions in North China have a history not unlike this.

To show still further the need for a health program for mission schools, I will give some of the findings from a physical examination of the teachers attending a summer normal conference in North China.

Among eighty-two women teachers, ranging in age from seventeen to thirty-five, these were the findings:

	<i>Per Cent</i>
Vision defects	44
Defective teeth	10
Unclean teeth	99
Trachoma	29
Enlarged tonsils	17
Deficient lung expansion	95
Enlarged thyroid	34
Enlarged cervical glands	20
Blood pressure below normal	6
Blood pressure above normal	4
Insufficient exercise during the school year and none during vacation	91
Organic heart lesion	1
Do not drink sufficient fluids to keep body in good condition	95
No knowledge of a balanced diet	100

Now, look at the results of the examination of the pupils of five schools in Changsha in Central China. These figures are for the school year 1922-23. Out of 812 students examined, the following physical defects were found:

Defective vision	363
Trachoma	118
Nasal obstruction	96
Tonsils	78
Defective teeth	136
Lungs	30
Heart	13
Kidney	9
Skin disease	48
Hernia	9
Phimosis	71

Based upon findings such as the foregoing, a proper health program for mission schools would include the following:

1. *Medical Examinations.*—There should be a medical examination of students by which those physically unfit might be eliminated from the school. This examination should be given after the student has passed the educational entrance tests, but before the student is allowed to be enrolled in school. The purpose of this examination would be to exclude those suffering from dangerous communicable diseases and organic defects which will make it improbable that the student concerned will be able to finish his course. Every pupil should present satisfactory evidence of having been immunized against smallpox, diphtheria and typhoid, or be immunized upon entering school.

2. *Correction of Defects.*—Every student enrolled in a mission school should be given a complete health examination yearly. These health examinations should be followed by correction of defects and treatment of remedial diseases. There must be full cooperation between the school principal, the physician and the student if this corrective work is to be successful. The principal is the key person in the situation. The corrective work should be done at the hospital, dispensary, or in rooms set aside for this work at the school.

Some checking up system should be used to help interest the student and get his cooperation in the corrections. A health rating card can be very helpful.

The Virginia State Board of Health rates children that measure up well in physical examination as five-point children. To be a five-point child:

- (1) The eyesight must be normal, or the defective vision corrected with glasses.
- (2) The hearing must be normal.
- (3) There must be no symptoms of trouble with nose and throat.
- (4) There must be no unfilled cavities in the teeth, and the teeth must be reasonably clean.
- (5) The child must not be more than 10 per cent under or more than 20 per cent above the average weight for the age and height.

I have here a chart which is being used by some of the health units in Virginia which helps to stimulate the interest of the child in getting defects corrected. This chart came from one of the schoolrooms in the health district in which I am now working.

The health examinations and follow-up treatments should be standardized and for this purpose a health examination chart should be adopted and used.

3. *Teaching Health*.—Systematic health teaching should be a part of the curriculum. The teaching should include

- (1) Fundamentals of public health:
 - (a) Bacteria, their origin, habits, and classification.
 - (b) Communicable diseases and how they are spread.
 - (c) Immunity, or body resistance to disease.
 - (d) Diseases due to faulty diet and bad habits.
- (2) Teaching of health habits should be the big part of the program, especially for the earlier years. Along with the teaching should go the practice of these habits. Teaching a child health ideals without making a brave attempt to get him to practise what he has learned is not only rather useless from the health standpoint but is bad pedagogy.

The habits that need stressing in North China are:

- (a) Posture—I walk, stand and sit erect.
- (b) Sleep—I sleep ten hours at night with windows open.
- (c) Clean hands—I wash my hands with soap and water before meals and after going to the toilet.
- (d) Teeth—I brush my teeth after breakfast and before going to bed.
- (e) Cleanliness—I take a full bath at least once a week.
- (f) Considering others—When sneezing or coughing, I cover my mouth and nose with a handkerchief.
- (g) Spitting—I do not spit.
- (h) Table manners—I do not use individual chopsticks in the common dish.
- (i) Mastication—I chew my food thoroughly.

(j) Regular habits—I go to stool at a regular time each day.

(k) I do not visit sick friends unless needed as a nurse.

For older students a personal health habit record can be used for several months out of the year to help fix the health habits which have not yet become firmly established. This gives the student a check on himself. Many pupils have been led to regular health habits by this checking.

(3) Sanitation. The pupils should be taught the fundamentals of sanitation. One way to teach them this is to have the buildings in which they live and go to school sanitary. The great loss of efficiency and life through diseases which are preventable by proper sanitation should be emphasized.

4. *Sanitation*.—This is the fourth division of the school health program. Many mission schools lack very much in their sanitary conditions and some are an actual menace to the health of the students and teachers. It is important that those responsible for the schools have a survey of their school grounds and buildings made and corrections finished as rapidly as possible.

The following are essential for proper sanitation of school premises:

(1) Proper construction of the kitchen and latrines, with screening against flies and mosquitoes and proper provision for lighting and ventilation.

(2) Disposal of human and kitchen wastes so as to prevent fly breeding.

(3) A good and abundant water supply.

(4) Living quarters with sufficient air, light, and proper screening. The faculty, students and servants should all have satisfactory living quarters.

(5) Class rooms should be properly constructed with especial attention to lighting and ventilation.

(6) Sanitary preparation and handling of food. Hygienic methods of eating should be insisted upon.

(7) Proper location and drainage of school grounds.

5. *Diet*.—A properly balanced diet is the fifth consideration and should be insisted upon for the school. This is not only needed for the proper development of the pupils but is a health educational factor for the community. In the section of China where I worked, one out of every twenty adult women had osteomalacia, a disease causing great suffering and great economic loss. The principal factor in the production of this disease is a faulty diet.

6. *Physical Education*.—Supervised play is also an item that should be included in the properly rounded health program. For this it is essential to have sufficient grounds and proper equipment. Play will not only aid the mental development of the child but will take the pupils out of doors. It will also develop team work and cooperation which are undeveloped traits in some peoples.

EXECUTION OF PROGRAMS

1. *Doctors and Nurses.*—Without the doctors and nurses giving thought and time to this phase of modern medical work, the program cannot be carried out. The doctors must be willing to rearrange their schedule so as to include the schools. In the nursing schools, the opportunity for school and public health nursing service must be kept before the students.

2. *Teachers.*—It is necessary to prepare teachers for the work. This training should be a regular part of the course in the normal schools. If teachers have to be used who have not had the advantages of a normal school or college, there should be special short-term schools organized where the fundamentals of health and physical education are taught. With what the teacher-pupils have already received in their school work, they should be able to get considerable knowledge and enthusiasm for health subjects in a six weeks' intensive course. A course of this kind takes considerable equipment and should be held where access can be had to microscopes, biological materials and charts.

3. *Literature.*—In addition to preparing teachers, it is necessary that textbooks and literature be prepared. If some one qualified to write a textbook in the native language can be found, this would be the best method of getting your textbooks. This, however, will not likely be possible, and the next best thing will be the translation of some good school textbook on hygiene with chapters or paragraphs so altered as to put the emphasis on the important subjects for the country in which you are working.

4. *Posters.*—Along with the preparation of textbooks, posters should be prepared which will teach the plain health lessons by the visual method. These posters can be used one at a time on the wall of the class room while that subject is being drilled into the student. Very effective posters for this work have been published in China by the Council on Health Education.

Whether the work be training the teacher, getting out textbooks and literature, or working up posters, it should be done in a union effort. It would not only be too expensive to be worked up by individual missions but would also be limited in its usefulness and in its presentation. The man or men most suitable for this work should be selected to develop and carry on this part of the health program.

In conclusion, let me emphasize again the absolute necessity for teaching the school children the things that can be applied. Put the emphasis on the application of a smaller number of facts rather than the teaching of a great mass of material with little or no application. At the present time in the Western nations there is a vast amount of knowledge on the subject of health, with only a small part of it being put into practical use. Let mission doctors, nurses, and teachers cooperate in giving a careful physical examination before

enrolling new pupils in school and in yearly health examinations with the correction of defects. Let the mission insist on proper health teaching, sanitary school grounds and buildings, a proper diet for the school pupils, and an adequate playground and equipment with supervised play. With these things accomplished, the mission will do the best thing for its pupils, will have a healthier and better church, will have a better return on its financial investments on the mission field, and will also set a new standard for the government schools.

SYMPOSIUM ON PUBLIC HEALTH NURSING

Efforts were made to secure the presentation to the Conference of a paper on Public Health Nursing. It was found that several nurses in the Conference had had experience in this field and at the Thursday morning session a period was devoted to a presentation by three of the nurses on this subject. The following is a very brief résumé of their remarks.

Miss E. K. Pennepacker: There are important ways of developing this kind of work. During the last few years visiting nursing and public health nursing has developed greatly in importance. The mission forces ought to make more use of this type of work, for nurses are not so expensive as doctors and thus the same amount of money would go farther. Visiting nursing has developed in the largest cities in this country and rural nursing has developed in the country districts. In New York City for example, there is the Henry Street Settlement. The nurse only sees people after the doctor has prescribed. She gives the treatment and finds many ways in which she can be of assistance in the family. Often she finds conditions that can be readily relieved. Another way of developing this type of work is in health programs. Health work has been tried in the schools where assembly talks are given by doctors and nurses, who are invited for that purpose. Plans can be made to exchange teachers and give the girls throughout the school a brief series of talks on health problems and how to take care of their homes, etc. Another type is the school nurse who is able to check up on the ills of the students and send them to the hospital for treatment if necessary. A mothers' club can be formed. If this is tried among the better class of women in the community they can be interested in starting clubs for the poorer women of the city. It is always advantageous to follow up the work that is done as much as possible.

Miss Orpha B. Gould: Miss Gould spoke on the general subject of school nursing and said that children are frequently afraid to go to the hospital and very good results may be secured by providing a national nurse to live in the school and help the children. The girls go readily to such a nurse and ask help on their problems, and the nurse can advise them when necessary to go to the hospital for treat-

ment and they will always go with the nurse more readily than alone. Because of the fact that girls are future mothers it is of very great importance that we train the younger women. In our school we fix up a little home and give the best two older girls each month the opportunity of keeping house with two of the younger children in the school. Their care of the children is checked up on every point. This results in the mothers of the children wanting to have training in these matters.

Miss Cornelia Dalenberg: Miss Dalenberg spoke on home nursing in Arabia, saying that it is necessary to work quite differently in Arabia from other countries. The women are very secluded and veiled and it is almost impossible for men doctors to serve them. It is very difficult to get the women to go to a hospital for confinement and a nurse visiting in the home is able to accomplish a very great deal. In one year I made 931 visits in the homes, mostly on confinement cases. The health lessons have to begin in a very elementary way when one goes into the homes. Every house has a towel, but that towel is never washed. This shows something of the health problems that face a nurse.

Following this symposium on nursing education, Dr. W. W. Peter made a brief statement in which he said that the whole question of health is one of attitude, not only for the students in the schools but also for the doctors and nurses who can work with them. In many countries in the Orient there are educational and medical schools in the same community and a doctor can start health work among the students to very good advantage and not simply limit himself to hospital operations. The School Health Movement in China is a very real movement.

PERSONNEL OF MEDICAL CONFERENCE

Dr. Theodore Bliss

Miss Katherine E. Bohn

Dr. J. H. Bradley

Dr. Emilie Bretthauer

Dr. Grafton Burke

Dr. William H. Cary

Dr. E. C. Cort

Miss Cornelia Dalenberg

Miss Denniston

Dr. R. L. Dickinson

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Miss Charlotte Dunlap

Dr. R. W. Dunlap

Miss Dorothy Dunning

Miss A. J. Fullerton

Dr. Julia R. Gibson

Dr. D. C. Gordon

Miss Orpha B. Gould

Miss Vernon Halliday

Town House, 67th St., and Central Pk. W.,
N. Y. C.

Calistoga, Calif.

Philadelphia Gen'l Hospital, Philadelphia, Pa.

303 East 20th St., N. Y. C.

281 Fourth Ave., N. Y. C.

Brooklyn Hospital, Brooklyn, N. Y.

20 Bower Hill Rd., South Hills, Pittsburg, Pa.

25 East 22nd St., N. Y. C.

276 Fifth Ave., N. Y. C.

59 East 54th St., N. Y. C.

156 Fifth Ave., N. Y. C.

c/o 281 Fourth Ave., N. Y. C.

424 West 119th St., N. Y. C.

41 Acheson Ave., Washington, Pa.

130 Claremont Ave., N. Y. C.

10 Nassau Bl'vd, Garden City, N. Y.

691 Chauncey St., Brooklyn, N. Y.

Elkins City Hospital, Elkins, W. Va.

109 Ayer St., Cadillac, Mich.

419 Fourth Ave., N. Y. C.

- Dr. James A. Harrar
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Mr. L. A. Hansen, Med. Sec.
- Dr. L. F. Heimburger
Ruth V. Hemenway, M.D.
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Mrs. E. H. Hudson
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Prof. I. M. Stewart
Dr. C. E. Tompkins
Dr. F. J. Tooker
Mr. C. S. Trimmer
Dr. F. F. Tucker
Dr. J. G. Vaughan
Miss Van Vliet
Dr. F. J. Wampler
Dr. Mark H. Ward
Dr. Hugh H. Weir
Mr. R. C. Wells
Dr. L. B. Wolf
- Lying-In Hospital, 17th & 2nd Ave., N. Y. C.
419 Fourth Ave., N. Y. C.
Gen'l Conference, Takoma Park, Washington, D. C.
Lawrenceville School, Lawrenceville, N. J.
Williamsburg, Mass.
1096 Sherman Blv'd, Milwaukee, Wis.
220 Clarendon St., Boston, Mass.
541 S. Yewdell St., W., Philadelphia, Pa.
541 S. Yewdell St., W., Philadelphia, Pa.
Post-Graduate Hospital, 301 East 20th St., N. Y. C.
99 Claremont Ave., N. Y. C.
173 Grove St., Auburndale, Mass.
276 Fifth Ave., N. Y. C.
221 Warren St., Allston, Mass.
111 W. Upsal St., Mt. Airy, Philadelphia, Pa.
10906 Hull Ave., N. E., Cleveland, Ohio.
30 Evansway, Boston, Mass.
880 Nottingham Ave., Grosse Pointe Pk., Detroit, Mich.
111 Oak Ave., Ithaca, N. Y.
419 Fourth Ave., N. Y. C.
The Cecil Apts., Baltimore, Md.
The Cecil Apts., Baltimore, Md.
4020 Vincent Ave., S., Minneapolis, Minn.
Clifton Springs Sanitarium, Clifton Springs, N. Y.
205 S. Sixth St., Darby, Pa.
37 Lee Ave., White Plains, N. Y.
370-7th Ave., N. Y. C.
243 Charles St., Boston, Mass.
235 East 49th St., N. Y. C.
c/o 281 Fourth Ave., N. Y. C.
P. O. Box 330, Nashville, Tenn.
c/o K. P. State Hospital, Kings Pk., L. I., N. Y.
85 Asquith Ave., Toronto, Canada.
c/o 281 Fourth Ave., N. Y. C.
Cameron St., Winchester, Va.
301 East 20th St., Post-Graduate Hospital, N. Y. C.
167 N. Grove St., East Orange, N. J.
c/o Dr. Vaughan, 150 Fifth Ave., N. Y. C.
Teachers College, B'way and 120th St., N. Y. C.
420 West 121st St., N. Y. C.
530 Monterey Ave., Pelham Manor, N. Y.
318 Amosland Rd., Morton, Pa.
120 E. College, Oberlin, Ohio.
150 Fifth Ave., N. Y. C.
c/o Brooklyn Hospital, Brooklyn, N. Y.
Onancock, Va.
14 Beacon St., Boston, Mass.
Society for Propagation of Gospel, London, Eng
156 Fifth Ave., N. Y. C.
18 E. Mt. Vernon Pl., Baltimore, Md.

FINDINGS ADOPTED BY THE CONFERENCE ON MEDICAL MISSIONS

April 3-5, 1928

1. *Use of Furlough.*

We would re-emphasize to the Mission Boards the great importance of setting aside a considerable portion of the first furlough of missionary doctors and nurses for professional study and we would recommend that the Medical Committee of the Committee of Reference and Counsel should assemble and make available all information possible concerning opportunities in the United States and Canada for such study.

We recommend for favorable consideration to the Boards a policy of granting one year furlough for medical missionaries and others engaged in professional work equally demanding frequent courses of study in centers of learning, such furloughs to be granted not less than once in five years.

We would advise doctors and nurses in the use of their furloughs to choose studies in the basic sciences, to select regular post graduate courses rather than so-called short or "brushing up" courses.

2. *Medical Missions in Africa.*

(a) *Advisory Board:*

We call attention to the recommendation adopted in the findings of the Le Zoute Conference on Missions in Africa, September 1926, that an International Advisory Medical Board be established for the development of the medical missionary work in all of Africa for fostering cooperation between missions and governments in their attack upon Africa's physical scourges such as Trypanosomiasis and in the development of public health work.

We therefore strongly urge the Foreign Missions Conference of North America to take up this matter with the mission groups in other countries with a view to the development in the immediate future of such an advisory medical organization as seems best fitted to the needs of Africa.

(b) *Medical School:*

In the face of the appalling and pressing need of doctors in the whole of Africa and the scarcity of trained assistants we recommend most strongly to the Africa Committee of the Committee of Reference and Counsel that they study the situation with regard to Medical education in Africa and that they aid in every way possible the starting in the near future of at least one medical school even on a modest scale rather than waiting for a large commitment, for the former plans would gather experience and point the way to growth.

We further recommend that the respective Boards interested provide or release the men necessary to further this project both in America as well as in Africa.

3. *Students and Medical Missions.*

(a) *Challenge to Students:*

We recognize the continued challenge that the medical needs of a large portion of the world presents to the Christian Church. We realize fully how inadequate are the forces both personal and financial that are trying to meet these needs.

We challenge the present student generation with this problem. The need for well-trained medical workers, doctors and nurses is as great as ever if not greater, for the non-Christian world is demanding the very best that the Christian world can offer. There is need at the present time for specialists in all branches of medical science, for workers in pioneer fields, in small and larger hospitals, in medical schools and in public health work.

(b) *Help for Medical Volunteers:*

We would call the attention of the churches and the mission boards to the difficulties and problems facing the medical students in securing a medical education adequate to meet the demands on the foreign field. We ask for these medical students the interest and help of the friends of medical missions.

4. *Licensure in Foreign Countries.*

We would recommend to the Medical Committee of the Committee of Reference and Counsel that a more thorough study be made of the problem of Licensure in the various foreign countries as it relates to the continuing of our medical missionary work and that the study include also the study of the existing regulations as regards the nursing profession on the foreign field.

5. *Vital Records of Missionaries.*

We would express our appreciation of the fact that a thorough and scientific study is to be made of the health records of some of the larger mission boards and our hope that as a result a more satisfactory system of vital records may be uniformly adopted by the Boards, and that the health of the missionaries both on the field and on furlough may be more fully protected and maintained.

6. *Public Health Education.*

We reaffirm the action at the last Medical Conference at Baltimore emphasizing the increasing importance of public health work, of health education in the mission schools and of cooperation in the work of the China Council on Health Education.

7. *Future Medical Conferences.*

(a) We reaffirm the great value to us as missionary doctors of these Conferences on Medical Missions, such as the one held in Baltimore in 1926 and this present conference at Riverdale. We would urge that similar conferences should be held at least every two years.

(b) We welcome the suggestion that at the next conference there



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be invited as full members of the conference, physicians who are nationals from the various mission fields and who will therefore be able to make their distinct contributions to the program and work of the conference.

(c) We also heartily endorse the plan of the present conference in devoting at least one or more sessions to papers and discussions on scientific subjects and on recent advances in medicine in which we are all interested.

(d) We would also suggest that the Committee on Program for the next conference arrange for presentation of papers in the special field of the nursing profession in the foreign field.

(e) We would refer to the Program Committee of the next Conference on Medical Missions, the subject of the needs on the foreign field for dentists and for dental education and the subject of more frequent furloughs for missionaries.

8. *General.*

(a) We recommend that missionary physicians going to tropical regions should take a course in tropical medicine.

(b) All medical missionaries should be encouraged to contribute to scientific medical progress and efforts should be made to secure funds for this purpose.

(c) We would call to the attention of all the missionary boards the great and urgent need for dentists among the foreign personnel in some of the mission fields, especially China.

(d) We would earnestly request of the Committee of Reference and Counsel that the papers read before the conference and the proceedings of the meetings be printed in a separate pamphlet or pamphlets and be made available for all interested in medical mission work.

(e) We desire to express the appreciation of the entire conference to the staff of the Riverdale Country School for their exceedingly kind hospitality to the members of the conference, also to the speakers, especially those who have read papers at the scientific sessions of the conference.

